THE
# JOURNAL
OF
# PHILOSOPHY

VOL. LIV, NO. 9: APRIL 25, 1957

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PUBLISHED FORTNIGHTLY
BY THE
JOURNAL OF PHILOSOPHY, INC.

# THE JOURNAL OF PHILOSOPHY

FOUNDED BY FREDERICK J. E. WOODBRIDGE AND WENDELL T. BUSH

EDITORS: Herbert W. Schneider, John H. Randall, Jr.

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Communications to the editors should be addressed to the Managing Editor, 713 Philosophy Hall, Columbia University, New York 27, N. Y. Subscriptions and advertisements should be sent to THE JOURNAL OF PHILOSOPHY, 713 Philosophy Hall, Columbia University, New York 27, N. Y. The annual subscription price (twenty-six numbers) is $5.25. The price of single numbers is 35 cents, double numbers, 60 cents.

THE JOURNAL OF PHILOSOPHY is owned by the Journal of Philosophy, Inc., and published fortnightly at Prince and Lemon Sts., Lancaster, Pa. Editorial Office: 713 Philosophy Hall, Columbia University, New York 27, N. Y. President, Albert G. Redpath; Vice President, John H. Randall, Jr.; Treasurer, Frederick A. Dewey; Secretary, Ernest Nagel.

Entered as second class matter, March 18, 1921, at the Post Office at Lancaster, Pa., under Act of Congress of March 3, 1879.

Acceptance for mailing at special rate of postage provided for in paragraph (d-2), section 34.40, P. L. & R. of 1948, authorized March 11, 1952.

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VOLUME LIV, No. 9 APRIL 25, 1957

THE JOURNAL OF PHILOSOPHY

# LOGIC AND ONTOLOGY

MY purpose in this article is first to discuss G. F. Warnock's "Metaphysics in Logic", published in *Essays in Conceptual Analysis* edited by Professor Antony Flew, and then to say what little I have to say on my own account on the same subject. I will begin with a few general remarks. Mr. Warnock belongs to the "Philosophy-Without-Tears" School, so named because it makes philosophy very much easier than it has ever been before: in order to be a competent philosopher, it is only necessary to study Fowler's *Modern English Usage;* post-graduates may advance to *The King's English,* but this book is to be used with caution for, as its title shows, it is somewhat archaic. Mr. Warnock states that we should not "impose the neat simplicities of logic upon the troublesome complexities of language". He is concerned to discuss the existential quantifier, and thinks it important to point out that a number of assertions, which the logician would represent by the one symbol $\exists$, would be represented in common speech by a variety of phrases, and on this ground he assumes that the general concept represented by $\exists$ is unimportant or spurious. This seems to me a totally absurd inference. Perhaps I can illustrate the absurdity by means of a fable.

Once upon a time, a very long while ago, there was a tribe which lived upon the banks of a river. Some say that the river was called "The Isis", and those who lived beside it, "The Isidians", but perhaps this is a later accretion to the original legend. The language of the tribe contained the words "minnow", "trout", "perch", and "pike", but did not contain the word "fish". A party of Isidians, proceeding down the river rather further than usual, caught what we call a salmon.[1] Immediately, a furious debate broke out: one party maintained that the creature was a sort of pike; the other party maintained that it was obscene and horrible, and that anybody who mentioned it should be banished from the tribe. At this juncture, a stranger arrived from the banks of another stream which was despised because it went footing slow. "In our tribe," he said, "we have the word 'fish' which applies

[1] See *Crotchet Castle,* Chapter IV.

equally to minnows, trout, perch, and pike, and also to this creature which is causing so much debate". The Isidians were indignant. "What is the use", they said, "of such new-fangled words? Whatever we get out of the river can be named in our language, since it is always a minnow or a trout or a perch or a pike. You may advance against this view the supposed recent occurrence in the lower reaches of our sacred stream, but we think it a linguistic economy to make a law that this occurrence shall not be mentioned. We therefore regard your word 'fish' as a piece of useless pedantry".

This fable is scarcely a parody of Mr. Warnock's argument about the existential quantifier. "Existential quantifier" is a general concept analogous to "fish". Applied to names, it is analogous to minnows; applied to predicates, it is analogous to trout; applied to relations, it is analogous to perch; and so on. The fact that in ordinary talk people use different words for different occasions when the logician uses the existential quantifier is due to the fact that people who have not studied logic have not arrived at the very general idea represented by $\exists$, just as the Isidians in the fable had not arrived at the general idea "fish". Mr. Warnock says that the existential quantifier confuses things that common speech distinguishes. This is exactly as if the Isidians had complained that a man who uses the word "fish" confuses minnows with pike. Mr. Warnock speaks of the "invaluable non-simplicity of ordinary speech". I do not deny that there are distinctions in ordinary speech which are not made in logic. In ordinary speech, we include the expression of our own emotions. If we say that So-&-so is an unmitigated scoundrel, or that unfortunately So-&-so has not invariably acted in accordance with the moral law, the element of fact in the two statements is the same, but our emotional attitude towards the one fact is different in the two cases.

Mr. Warnock deliberately and consciously ignores all that logicians have done to clarify the problems with which he professes to deal. He makes play with the statement "Valhalla is mythological". He does not mention the somewhat careful theory according to which statements that seem to be about Valhalla are really about "Valhalla". This theory may be right or wrong, but I cannot see the justification for pretending that there is no such theory. He tells us at the beginning of his article that the central question with which he is concerned is: are there abstract entities? He then proceeds to object to the logician's interpretation of the words "there are", and on this ground (at least, I can find no other in his article) he leaves his central question unanswered and,

apparently, in his view unanswerable. He points out, quite truly, that the use of the word "something" does not, in ordinary speech, imply that there is such a thing. He instances the statement "something is a prime number", which, as he says, "is odd and mystifying". It does not occur to him that the language of mathematical logic surpasses common language both in precision and in generality. If you have twelve things and twelve names, it may easily happen that common speech applies all twelve names to all twelve things. Common speech has two opposite defects: it has often one word with many meanings and many words with one meaning. The former defect may be illustrated by the following sentence: "Whether Romulus existed is doubtful, since reasons exist for questioning the reliability of existing legends as to the first century of Rome's existence". The opposite defect of having several expressions for the same meaning is illustrated by Mr. Warnock's discussion of when we should say "There are primes", "Lions still exist in Africa", "There are shadows on the moon"—which last, he seems to think, does not imply that shadows exist, a phrase which he rejects solely on the ground that most people would not use it. The logician thinks that a language is preferable in which there is one name for one thing. And when I say "preferable", I do not mean "preferable" for every-day use, but "preferable" in an attempt to make precise statements about the world.

I come now to the particular question of "existence". I maintain—and I think that this has great importance in avoiding muddles—that the word "existence" as ordinarily used gives rise to syntactical confusion and has been a source of a great deal of metaphysical confusion. Take, for example, the following piece of reasoning: "my present sensation exists; this is my present sensation; therefore this exists". I maintain that the two premisses may be true, but the conclusion is nonsense. It is impossible to make this clear in common language. This is an argument against common language. I maintain that the only legitimate concept involved is that of $\exists$. This concept may be defined as follows: given an expression $fx$ containing a variable, $x$, and becoming a proposition when a value is assigned to the variable, we say that the expression $(\exists x).fx$ is to mean that there is at least one value of $x$ for which $fx$ is true. I should prefer, myself, to regard this as a definition of "there is", but, if I did, I could not make myself understood.

When we say "there is" or "there are", it does not follow from the truth of our statement that what we say there is or there are is part of the furniture of the world, to use a deliberately vague

phrase. Mathematical logic admits the statement "there are numbers" and metalogic admits the statement "numbers are logical fictions or symbolic conveniences". Numbers are classes of classes, and classes are symbolic conveniences. An attempt to translate $\exists$ into ordinary language is bound to land one in trouble, because the notion to be conveyed is one which has been unknown to those who have framed ordinary speech. The statement "there are numbers" has to be interpreted by a rather elaborate process. We have first to start with some propositional function, say $fx$, then to define "the number of things having the property $f$", then to define "number" as "whatever is the number of things having some property or other". In this way we get a definition of the propositional function "$n$ is a number", and we find that if we substitute for $n$ what we have defined as "1", we have a true statement. This is the sort of thing that is meant by saying there is at least one number, but it is very difficult, in common language, to make clear that we are not making a platonic assertion of the reality of numbers.

The relation of logic to ontology is, in fact, very complex. We can in some degree separate linguistic aspects of this problem from those that have a bearing on ontology. The linguistic problems are capable, at least in theory, of a precise solution, but the ontological problems remain much more obscure. The purely linguistic problems, however, have an ontological background, though a somewhat vague one. Sentences are composed of words, and, if they are to be able to assert facts, some, at least, of the words must have that kind of relation to something else which is called "meaning". If a waiter in a restaurant tells me, "We have some very nice fresh asparagus", I shall be justly incensed if he explains that his remark was purely linguistic and bore no reference to any actual asparagus. This degree of ontological commitment is involved in all ordinary speech. But the relation of words to objects other than words varies according to the kind of word concerned, and this gives rise to a logical form of the doctrine of parts of speech. If a sentence is to have significance, unless it is a sentence of pure logic, some of its words must point to something, but others need not. A sentence could not significantly contain the phrase "The Queen of England" unless there were something in the world that was pointed to by the word "Queen" and by the word "England", but there need not be anything pointed to by the word "the" or the word "of". A large part of the bearing of mathematical logic upon ontology consists in diminishing the number of objects required in order to make sense of statements which we feel to be intelligible. The only reason for this process of whittling

away is to avoid rash and unwarranted assumptions. If our ordinary empirical statements are to be significant, they must (if they are not linguistic) point to something outside words. The purely technical question thus arises: what is the smallest vocabulary which will enable us to assert what we believe to be fact?

Presuming this problem solved, we are left with the ontological problem: what relations must subsist between our words and sentences, on the one hand, and fact, on the other, if our words are to have meaning and our sentences are to be significant? We can, to begin with, exclude from our vocabulary all words that have a verbal definition, since we can always substitute the definition for the words. Sometimes (omitting niceties) the relation of a word to an object is fairly clear: we know the object indicated by the name "Dwight D. Eisenhower"; we know what we mean by the names of colours; and so on. But there are other words about which we feel more difficulty: if we say "Alexander preceded Caesar", we feel (perhaps mistakenly) that Alexander and Caesar are solid. But what about the word "preceded"? We could, at a pinch, imagine a universe consisting only of Alexander or only of Caesar or only of the pair of them. But we cannot imagine a universe consisting only of "preceded". It is this sort of thing that has led to belief in substance and to doubt about universals. Here, again, the needs of language are clear, but the metaphysical implications of these needs are obscure. We cannot do without such words as "precede", but such words do not seem to point at one of the bricks of the universe in the kind of way in which proper names can do.

The question "Are there universals?" can be interpreted in various ways. In the first place, it can be interpreted in the sense of the existential quantifier. We can say: "There are sentences containing two names and a relation-word, and without such sentences many assertions of facts which we believe ourselves to know would be impossible". We can go on to say that, just as the names in such sentences point to objects, so the relation-words must point to something extra-linguistic. It is a fact that Alexander preceded Caesar, and this fact does not consist merely of Alexander and Caesar. Relation-words, it is clear, serve a purpose in enabling us to assert facts which would otherwise be unstatable. So far, I think, we are on firm ground. But I do not think it follows that there is, in any sense whatever, a "thing" called "preceding". A relation-word is only used correctly when relata are supplied.

This applies equally to predicates. Quine finds a special difficulty when predicates or relation-words appear as apparent variables. Take, for example, the statement "Napoleon had all the

qualities of a great general". This will have to be interpreted as follows: "whatever $f$ may be, if '$x$ was a great general' implies $fx$, whatever $x$ may be, then $f$(Napoleon)". This seems to imply giving a substantiality to $f$ which we should like to avoid if we could. I think the difficulty real, and I do not know the answer. We certainly cannot do without variables that represent predicates or relation-words, but my feeling is that a technical device should be possible which would preserve the differences of ontological status between what is meant by names, on the one hand, and predicates and relation-words, on the other.

What mathematical logic does is not to establish ontological status where it might be doubted, but rather to diminish the number of words which have the straight-forward meaning of pointing to an object. It used to be a common view that all the integers were entities, and those who would not go so far as this were at least persuaded that the number 1 is an entity. We cannot prove that this is not the case, but we can prove that mathematics affords no evidence for it.

Finally, the question "Are there universals?" is ambiguous. In some interpretations, the answer is certainly "yes"; in others, no decisive answer seems possible at present. What I have to say about the ontological status of universals is contained in the last chapter of *An Inquiry into Meaning and Truth.*

BERTRAND RUSSELL

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## NOTES ON LOGIC

### INTRODUCTION

IN the spring of 1914 Bertrand Russell came to Harvard as a visiting lecturer. One of his two courses was on logic, and I was assigned to assist him with it. He was late in arriving, and I gave two or three weeks of lectures, mostly on how to read the symbolism of the *Principia Mathematica.* His lectures also largely followed the *Principia.* He assigned Frege's *Foundations of Arithmetic* to be read—in German. He also had with him some notes and excerpts, giving the opinions of a brilliant student of his, named Ludwig Wittgenstein, who had been recommended by Frege to come to him. I copied this manuscript, dated September, 1913.

It is Wittgenstein's theory of that time about propositions. I may say, as a first approximation of my own, a proposition is not the words of a statement, but it is *what the statement says.* It is the same proposition, whether it is asserted or denied, believed, con-

sidered, referred to, emoted over. In a sense it is intended as a description of fact, but you can understand it without knowing the fact, if you know *what would be the case if the proposition were true, and what the case if it were false.* It always has a contradictory, only one of them true, the other false. It and its contradictory have a complementary "sense" (*Sinn*), and the same "meaning" (*Bedeutung*), the meaning being the external fact, the fact meant, and they have only one fact between them. The two thus referring to the same fact, says Wittgenstein, are really only one proposition with two poles. You are able to verify the proposition as true when you observe that the pole you have asserted fits the fact. But it remains the statement of two alternative possibilities, of which you now know which alternative is true. The verified proposition is still double and symbolic, and does not fuse with the corresponding fact and disappear—as it did, for instance, in Royce's Hegelian "inner meaning and outer meaning of an idea." If you deny a proposition instead of asserting it, you reverse the polarity, and two such denials bring you back where you started. Russell indicated this on the blackboard by an arrow, which you might reverse and reverse again.

Wittgenstein's own *ab*-notation for the duality is puzzling in this paper, because used without much explanation. In 1914 I drew matrix diagrams on the margin of my transcript to illustrate the discussion of true-false "molecular" propositions, combinations of propositions connected by "or," "and," "if-then," the conjunctions all of which had just been reduced by Sheffer to repetitions of his "stroke-relation." Russell had drawn the conclusion that there is no "or" in the objective world, so in general there is nothing to correspond to these molecular propositions in the outer world of facts, nor to any other conjunction, so this theory is, as regards facts, a "logical atomism."

In these days, when the Russell Analysts, and the Wittgenstein Semanticists confront one another almost as hostile camps, this present document from the time of common origins has taken on a renewed importance.

HARRY T. COSTELLO

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PRELIMINARY

In philosophy there are no deductions; it is purely descriptive. The word "philosophy" ought always to designate something over or under, but not beside, the natural sciences. Philosophy gives no pictures of reality, and can neither confirm nor confute scientific investigations. It consists of logic and metaphysics, the former its

basis. Epistemology is the philosophy of psychology. Distrust of grammar is the first requisite for philosophizing. Philosophy is the doctrine of the logical form of scientific propositions (not primitive propositions only). A correct explanation of the logical propositions must give them a unique position as against all other propositions.

## I. Bi-polarity of Propositions. Sense and Meaning. Truth and Falsehood

Frege said "propositions are names"; Russell said "propositions correspond to complexes". Both are false; and especially false is the statement "propositions are names of complexes". Facts cannot be named. The false assumption that propositions are names leads us to believe there must be "logical objects": for the meaning of logical propositions would have to be such things.

What corresponds in reality to a proposition depends upon whether it is true or false. But we must be able to understand a proposition without knowing if it is true or false. What we know when we understand a proposition is this: we know what is the case if it is true and what is the case if it is false. But we do not necessarily know whether it is actually true or false.

Every proposition is essentially true-false. Thus a proposition has two poles (corresponding to case of its truth and case of its falsity). We call this the *sense* of a proposition. The *meaning* of a proposition is the fact which actually corresponds to it. The chief characteristic of my theory is: *p has the same meaning as not–p* (constituent = particular, component = particular or relation, etc.).

Neither the sense nor the meaning of a proposition is a thing. These words are incomplete symbols. It is clear that we understand propositions without knowing whether they are true or false. But we can only know the meaning of a proposition when we know if it is true or false. What we understand is the sense of the proposition. To understand a proposition $p$ it is not enough to know that $p$ implies "$p$ is true", but we must also know that $\sim p$ implies "$p$ is false". This shows the bi-polarity of the proposition. We understand a proposition when we understand its constituents and forms. If we know the meaning of "$a$" and "$b$" and if we know what "$xRy$" means for all $x$'s and $y$'s, then we also understand "$aRb$". I understand the proposition "$aRb$" when I know that either the fact that $aRb$ or the fact that not $aRb$ corresponds to it; but this is not to be confused with the false opinion that I understand "$aRb$" when I know that "$aRb$ or not $aRb$" is the case.

Strictly speaking, it is incorrect to say we understand the proposition $p$ when we know that "$p$ is true" $\equiv p$; for this would

naturally always be the case if accidentally the propositions to right and left of the symbol ≡ were either both true or both false. We require not only an equivalence but a formal equivalence, which is bound up with the introduction of the form of *p*. What is wanted is the formal equivalence with respect to the forms of the proposition, i.e., all the general indefinables involved.

There are *positive and negative facts:* if the proposition "This rose is not red" is true, then what it signifies is negative. But the occurrence of the word "not" does not indicate this unless we know that the signification of the proposition "This rose is red" (when it is true) is positive. It is only from both, the negation and the negated proposition, that we can conclude about a characteristic of the signification of the whole proposition. (We are not here speaking of the negations of *general* propositions, i.e., of such as contain apparent variables. Negative facts only justify the negations of atomic propositions.) Positive and negative facts there are, but not true and false facts.

If we overlook the fact that propositions have a *sense* which is independent of their truth or falsehood, it easily seems as if true and false were two equally justified relations between the sign and what is signified. (We might then say, e.g., that "*q*" *signifies* in the true way what "not-*q*" *signifies* in the false way.) But are not true and false in fact equally justified? Could we not express ourselves by means of false propositions just as well as hitherto with true ones, so long as we know that they are meant falsely? No, for a proposition is true when it is as we assert in the proposition; and accordingly if by "*q*" we mean "not-*q*", and it is as we mean to assert, then in the new interpretation "*q*" is actually true and *not* false. But it is important that we *can* mean the same by "*q*" as by "not-*q*", for it shows that neither to the symbol "not" nor to the manner of its combination with "*q*" does a characteristic of the denotation of "*q*" correspond.

An analogy for the theory of truth: Consider a black patch on white paper. Then we can describe the form of the patch by mentioning, for each point of the surface, whether it is white or black. To the fact that a point is black corresponds a positive fact; to the fact that a point is white (not black) corresponds a negative fact. If I designate a point of the surface (one of Frege's "truth-values"), this is as if I set up an assumption to be decided upon. But in order to be able to say of a point that it is black or it is white, I must first know when a point is to be called black and when it is to be called white. In order to be able to say that "*p*" is true (or false), I must first have determined under what circumstances I call a proposition true, and thereby I determine the *sense* of a proposi-

tion. The point in which the analogy fails is this: I can indicate a point of the paper which is white and black, but to a proposition without sense nothing corresponds, for it does not designate a thing (truth-value) whose properties might be called "false" or "true". The verb of a proposition is not "is true" or "is false", as Frege believes, but what is true must already contain the verb.

The comparison of language and reality is like that of a retinal image and visual image: to the blind spot nothing in the visual image seems to correspond, and thereby the boundaries of the blind spot determine the visual image—just as true negations of atomic propositions determine reality.

One is tempted to interpret "not-$p$" as "everything else, only not $p$". That from a single fact $p$ an infinity of others, not not-$p$, etc., follow is hardly credible. Man possesses an innate capacity for constructing symbols with which *some* sense can be expressed without having the slightest idea what each word signifies. The best example of this is mathematics, for man has until recently used the symbols for numbers without knowing what they signify or that they signify nothing.

The assertion sign is logically quite without significance. It only shows, in Frege and in Whitehead and Russell, that these authors hold the propositions so indicated to be true. "$\vdash$", therefore, belongs as little to the proposition as (say) the number of the proposition. A proposition cannot possibly assert of itself that it is true. Assertion is merely psychological. There are only unasserted propositions. Judgment, command, and question all stand on the same level; but all have in common the propositional form, and that alone interests us. What interests logic are only the unasserted propositions.

When we say $A$ judges that, etc., then we have to mention a whole proposition which $A$ judges. It will not do either to mention only its constituents, or its constituents and form but not in the proper order. This shows that a proposition itself must occur in the statement to the effect that it is judged. For instance, however "not-$p$" may be explained, the question "What is negated?" must have a meaning. In "$A$ judges (that) $p$", $p$ cannot be replaced by a proper name. This is apparent if we substitute "$A$ judges that $p$ is true and not-$p$ is false". The proposition "$A$ judges (that) $p$" consists of the proper name $A$, the proposition $p$ with its two poles, and $A$'s being related to both these poles in a certain way. This is obviously not a relation in the ordinary sense. Every right theory of judgment must make it impossible for me to judge that "this table penholders the book" (Russell's theory does not satisfy this requirement). The structure of the proposition must be recognized

and then the rest is easy. But ordinary language conceals the structure of the proposition: in it relations look like predicates, and predicates like names, etc.

One reason for supposing that not all propositions which have more than one argument are relational propositions is that, if they were, the relations of judgment and inference would have to hold between an arbitrary number of things. The idea that propositions are names for complexes has suggested that whatever is not a proper name is a sign for a relation. Russell, for instance, imagines every fact as a spatial complex, and since spatial complexes consist of things and relations only, therefore he holds all do.

We are very often inclined to explanations of logical functions of propositions which aim at introducing into the function either only the constituents of these propositions, or only their form, etc., and we overlook the fact that ordinary language would not contain the whole propositions if it did not need them.

Names are points, propositions arrows—they have *sense*. The sense of a proposition is determined by the two poles *true* and *false*. The form of a proposition is like a straight line, which divides all points of a plane into right and left. The line does this automatically, the form of the proposition only by convention. It is wrong to conceive every proposition as expressing a relation. A natural attempt at such a solution consists in regarding "not-$p$" as the opposite of "$p$", where, then, "opposite" would be the indefinable relation. But it is easy to see that every such attempt to replace functions with sense (*ab* functions) by descriptions, must fail.

When we say "$A$ believes $p$", this sounds, it is true, as if we could here substitute a proper name for "$p$". But we can see that here a *sense*, not a meaning, is concerned, if we say "$A$ believes that $p$ is true", and in order to make the direction of $p$ even more explicit, we might say "$A$ believes that '$p$' is true and 'not-$p$' is false". Here the bi-polarity of $p$ is expressed, and it seems that we shall only be able to express the proposition "$A$ believes $p$" correctly by the *ab* notation (later explained) by, say, making "$A$" have a relation to the poles "$a$" and "$b$" of $a$–$p$–$b$. The epistemological questions concerning the nature of judgment and belief cannot be solved without a correct apprehension of the form of the proposition.

A proposition is a standard with reference to which facts behave, but with names it is otherwise. Just as one arrow behaves to another arrow by being in the same sense or the opposite, so a fact behaves to a proposition; it is thus bi-polarity and sense come in. In this theory $p$ has the same meaning as not-$p$ but opposite sense. The meaning is the fact. A proper theory of judgment must make it impossible to judge nonsense. The "sense of" an *ab* function of

a proposition is a function of its sense. In not-$p$, $p$ is exactly the same as if it stands alone (this point is absolutely fundamental). Among the facts which make "$p$ or $q$" true there are also facts which make "$p$ and $q$" true; hence, if propositions have only meaning, we ought, in such a case, to say that these two propositions are identical. But in fact their sense is different, and we have introduced sense by talking of all $p$'s and all $q$'s. Consequently the molecular propositions will only be used in cases where their $ab$ function stands under a generality sign or enters into another function such as "I believe that", etc., because then the sense enters.

## II. Analysis of Atomic Propositions. General Indefinables, Predicates, etc.

It may be doubted whether, if we formed all possible atomic propositions, "the world would be completely described if we declared the truth or falsehood of each" (Russell).

If there were a world created in which the principles of logic were true, in that world the whole of mathematics holds. No world can be created in which a proposition is true, unless the constituents of the proposition are created also.

Indefinables are of two sorts: names and forms. Propositions cannot consist of names alone, they cannot be classes of names. A name cannot only occur in two different propositions, but can occur in the same way in both. Propositions, which are symbols having reference to facts, are themselves facts (that this inkpot is on this table may express that I sit in this chair). We must be able to understand propositions we have never heard before. But every proposition is a new symbol. Hence we must have *general* indefinable symbols; these are unavoidable if propositions are not all indefinable. Only the doctrine of general indefinables permits us to understand the nature of functions. Neglect of this doctrine leads us to an impenetrable thicket.

A proposition must be understood when *all* its indefinables are understood. The indefinables in "$aRb$" are introduced as follows: (1) "$a$" is indefinable, (2) "$b$" is indefinable, (3) whatever "$x$" and "$y$" may mean, "$xRy$" says something indefinable about their meaning.

We are not concerned in logic with the relation of any specific name to its meaning and just as little with the relation of a given proposition to reality. We do want to know that our names have meanings and propositions sense, and we thus introduce an indefinable concept "$A$" by saying " '$A$' denotes something indefinable", or the form of propositions $aRb$ by saying: "For all meanings of '$x$' and '$y$', '$xRy$' expresses something indefinable about $x$ and $y$."

The form of a proposition may be symbolized in the following way: Let us consider symbols of the form "*xRy*", to which correspond primarily pairs of objects of which one has the name "*x*", the other the name "*y*". The *x*'s and *y*'s stand in various relations to each other, and among other relations the relation *R* holds between some but not between others. I now determine the sense of "*xRy*" by laying down the rule: when the facts behave in regard to "*xRy*" so that the meaning of "*x*" stands in the relation *R* to the meaning of "*y*", then I say that these facts are "of like sense" (*gleichsinnig*) with the proposition "*xRy*"; otherwise, "of opposite sense" (*entgegengesetzt*). I correlate the facts to the symbol "*xRy*" by thus dividing them into those of like sense and those of opposite sense. To this correlation corresponds the correlation of name and meaning. Both are psychological. Thus I understand the form "*xRy*" when I know that it discriminates the behavior of *x* and *y* according as these stand in the relation *R* or not. In this way I extract from all possible relations the relation *R*, as by a name, I extract its meaning from among all possible things.

There is no *thing* which is the *form* of a proposition, and no name which is the name of a form. Accordingly we can also not say that a relation which in certain cases holds between things holds sometimes between forms and things. This goes against Russell's theory of judgment.

Symbols are not what they seem to be. In "*aRb*" "*R*" looks like a substantive but it is not one. What is symbolized in "*aRb*" is that *R* occurs-between *a* and *b*. Hence "*R*" is *not* the indefinable in "*aRb*". Similarly in "$\phi x$" "$\phi$" looks like a substantive but is not one; in "$\sim p$", "$\sim$" looks like "*q*" but is not like it. This is the first thing that indicates there *may* not be logical constants. A reason against them is the generality of logic: logic cannot treat a special set of things.

Russell's "complexes" were to have the useful property of being compounded, and were to combine with this the agreeable property that they could be treated like "simples". But this alone makes them unserviceable as logical types (forms), since there would then have been significance in asserting, of a simple, that it was complex. But a *property* cannot be a logical type.

A false theory of relations makes it easily seem as if the relation of fact and constituent were the same as that of fact and fact-which-follows-from-it. But there is a similarity of the two, expressible thus: $\phi a . \supset_{\phi a} . a = a$.

Every statement about complexes can be resolved into the logical sum of a statement about the constituents and a statement about the proposition which describes the complex completely. How, in

each case, the resolution is to be made, is an important question, but its answer is not unconditionally necessary for the construction of logic. To repeat: every proposition which seems to be about a complex can be analyzed into a proposition about its constituents and about the proposition which describes the complex perfectly; i.e., that proposition which is equivalent to saying the complex exists.

### III. Analysis of Molecular Propositions: *ab* Functions

Whatever corresponds in reality to compound propositions must not be more than what corresponds to their several atomic propositions. Molecular propositions contain nothing beyond what is contained in their atoms; they add no material information above that contained in their atoms. All that is essential about molecular functions is their T-F (true-false) schema (i.e., the statement of the cases where they are true and cases where they are false). It is *a priori* likely that the introduction of atomic propositions is fundamental for the understanding of all other kinds of propositions. In fact, the understanding of general propositions obviously depends on that of atomic propositions.

One reason for thinking the old notation wrong is that it is very unlikely that from every proposition $p$, an infinite number of other propositions not–not–$p$, not–not–not–not–$p$, etc., should follow. The very possibility of Frege's explanations of "not–$p$" and "if $p$ then $q$", from which it follows that "not–not–$p$" denotes the same as $p$, makes it probable that there is some method of designation in which "not–not–$p$" corresponds to the same symbol as "$p$". But if this method of designation suffices for logic, it must be the right one. If $p$ = not–not–$p$, etc., this shows that the traditional method of symbolism is wrong, since it allows a plurality of symbols with the same sense; and thence it follows that in analyzing such propositions, we must not be guided by Russell's method of symbolizing.

Naming is like pointing. A function is like a line dividing points of a plane into right and left ones; then "$p$ or not–$p$" has no meaning because it does not divide the plane. But though a particular proposition, "$p$ or not–$p$", has no meaning, a general proposition, "For all $p$'s, $p$ or not–$p$", has a meaning, because this does not contain the nonsensical function "$p$ or not–$p$", but the function "$p$ or not–$q$", just as "for all $x$'s, $xRx$" contains the function "$xRy$".

Logical inferences can, it is true, be made in accordance with Frege's or Russell's laws of deduction, but this cannot justify the inference; and therefore they are not primitive propositions of logic. If $p$ follows from $q$, it can also be inferred from $q$, and the "manner of deduction" is indifferent.

The reason why "~Socrates" means nothing is that "~$x$" does

not express a property of $x$. Signs of the forms "$p \vee \sim p$" are senseless, but not the proposition "$(p)\ p \vee \sim p$". If I know that this rose is either red or not red, I know nothing. The same holds of all *ab* functions. The assumption of the existence of logical objects makes it appear remarkable that in the sciences propositions of the form "$p \vee q$", "$p \supset q$", etc., are only then not provisional when "$\vee$" and "$\supset$" stand within the scope of a generality-sign (apparent variable). That "or" and "not", etc., are not relations in the same sense as "right" and "left", etc., is obvious to the plain man. The possibility of cross-definition in the old logical indefinables shows, of itself, that these are not the right indefinables, and even more conclusively, that they do not denote relations. Logical indefinables cannot be predicates or relations, because propositions, owing to sense, cannot have predicates or relations. Nor are "not" and "or", like judgment, *analogous* to predicates and relations, because they do not introduce anything new.

In place of every proposition "$p$" let us write "$\overset{a}{b}p$". Let every correlation of propositions to each other or of names to propositions be effected by a correlation of their poles "$a$" and "$b$". Let this correlation be transitive. Then accordingly "$\overset{a}{b}\!-\!\overset{a}{b}p$" is the same symbol as "$\overset{a}{b}p$". Let $n$ propositions be given. I then call a "class of poles" of these propositions every class of $n$ members, of which each is a pole of one of the $n$ propositions, so that one member corresponds to each proposition. I then correlate with each class of poles one of two poles ($a$ and $b$). The sense of the symbolizing fact thus constructed I cannot define, but I know it.

The sense of an *ab* function of $p$ is a function of the sense of $p$. The *ab* functions use the discrimination of facts which their arguments bring forth in order to generate new discriminations. The *ab* notation shows the dependence of *or* and *not*, and thereby that they are not to be employed as simultaneous indefinables.

To every molecular function a TF (or *ab*) scheme corresponds. Therefore we may use the TF scheme itself instead of the function. Now what the TF scheme does is that it correlates the letters T and F with each proposition. These two letters are the poles of atomic propositions. Then the scheme correlates another T and F to these poles. In this notation all that matters is the correlation of the outside poles to the poles of the atomic propositions. Therefore not–not–$p$ is the same symbol as $p$. And therefore we shall never get two symbols for the same molecular function. As the *ab* (TF) functions of atomic propositions are bi-polar propositions again, we can perform *ab* operations on them. We shall, by doing so, correlate two new outside poles via the old outside poles to the poles of the atomic propositions.

The symbolizing fact in *a–p–b* is that *say a* is on the left of *p* and *b* on the right of *p*. [This is quite arbitrary, but if we once have fixed on which order the poles have to stand in, we must of course stick to our convention. If, for instance, "*apb*" says *p*, then *bp* says *nothing* (it does *not* say $\sim p$). But *a–apb–b* is the same symbol as *apb* (here the *ab* function vanishes automatically) for here the new poles are related to the same side of *p* as the old ones. The question is always: how are the new poles correlated to *p* compared with the way the old poles are correlated to *p*?] Then, given *apb*, the correlation of new poles is to be transitive, so that, for instance, if a new pole *a* in whatever way, i.e., via whatever poles, is correlated to the inside *a*, the symbol is not changed thereby. It is therefore possible to construct all possible *ab* functions by performing one *ab* operation repeatedly, and we can therefore talk of all *ab* functions as of all those functions which can be obtained by performing this *ab* operation repeatedly (cf., Sheffer's work).

Among the facts which make "*p* or *q*" true, there are some which make "*p* and *q*" true; but the class which makes "*p* or *q*" true is different from the class which makes "*p* and *q*" true; and only this is what matters. For we introduce this class, as it were, when we introduce *ab* functions.

Since the *ab* functions of *p* are again bi-polar propositions, we can form *ab*-functions of them, and so on. In this way a series of propositions will arise, in which, in general, the *symbolizing* facts will be the same in several members. If now we find an *ab* function of such a kind that by repeated applications of it every *ab*-function can be generated, then we can introduce the totality of *ab*-functions as the totality of those that are generated by the application of this function. Such a function is $\sim p \vee \sim q$. It is easy to suppose a contradiction in the fact that, on the one hand, every possible complex proposition is a simple *ab* function of simple propositions, and that, on the other hand, the repeated application of one *ab* function suffices to generate all these propositions. If, e.g., an affirmation can be generated by double negation, is negation in any sense contained in affirmation? Does "*p*" deny "not–*p*" or assert "*p*", or both? And how do matters stand with the definition of "$\supset$" by "$\vee$" and ".", or of "$\vee$" by "." and "$\supset$"? And how, e.g., shall we introduce $p|q$ (i.e., $\sim p \vee \sim q$), if not by saying that this expression says something indefinable about all arguments *p* and *q*? But the *ab*-functions must be introduced as follows: The function $p|q$ is merely a mechanical instrument for constructing all possible *symbols* of *ab*-functions. The symbols arising by repeated application of the symbol "|" do *not* contain the symbol "$p|q$". We need a rule according to which we can form all symbols of *ab* functions,

in order to be able to speak of the class of them; and we now speak of them, e.g., as those symbols of functions which can be generated by repeated application of the operation "|". And we say now: For all $p$'s and $q$'s, "$p|q$" says something indefinable about the sense of those simple propositions which are contained in $p$ and $q$.

## IV. Analysis of General Propositions

Just as people used to struggle to bring all propositions into the subject-predicate form, so now it is natural to conceive every proposition as expressing a relation, which is just as incorrect. What is justified in this desire is fully satisfied by Russell's theory of manufactured relations.

If only those signs which contain proper names are complex, then propositions containing nothing but apparent variables would be simple. Then what about their denials? Propositions are always complex, even if they contain no names.

There are no propositions containing real variables. Those symbols which are called propositions in which "variables occur" are in reality not propositions at all, but only schemes of propositions, which do not become propositions unless we replace the variables by constants. There is no proposition which is expressed by "$x = x$", for "$x$" has no signification. But there is a proposition "$(x).x = x$", and propositions such as "Socrates = Socrates", etc. In books on logic no variables ought to occur, but only general propositions which justify the use of variables. It follows that the so-called definitions in logic are not definitions, but only schemes of definitions, and instead of these we ought to put general propositions. And similarly, the so-called primitive ideas (*Urzeichen*) of logic are not primitive ideas but schemes of them. The mistaken idea that there are *things* called facts or complexes and relations easily leads to the opinion that there must be a relation of *questioning* to the facts,[1] and then the question arises whether a relation can hold between an arbitrary number of things, since a fact can follow from arbitrary causes. It is a fact that the proposition which, e.g., expresses that $q$ follows from $p$ and $p \supset q$ is this: $p.\ p \supset q.\ \supset_{p,q}.q$.

Cross-definability in the realm of general propositions leads to quite similar questions to those in the realm of *ab* functions. There is the same objection in the case of apparent variables to the usual indefinables as in the case of molecular functions. The application of the *ab* notation to apparent variable propositions becomes clear if we consider that, for instance, the proposition "for all $x$, $\phi x$" is to be true when $\phi x$ is true for all $x$'s, and false when $\phi x$ is false for some $x$'s. We see that *some* and *all* occur simultaneously in the

[1] "A relation of a relation to the facts"?—H.T.C.

proper apparent variable notation. The notation is

for $(x)\phi x$: $a\text{-}(x)\text{-}.a\ \phi xb.\text{-}(\exists x)\text{-}b$ and
for $(\exists x)\phi x$: $a\text{-}(\exists x)\text{-}.a\ \phi xb.\text{-}(x)\text{-}b$

Old definitions now become tautologous.

A very natural objection to the way in which I have introduced, e.g., propositions of the form $xRy$ is that by it propositions such as $(\exists x,y)xRy$ and similar ones are not explained, which, yet obviously have in common with $aRb$ what $cRd$ has in common with $aRb$. *But* when we introduce propositions of the form $xRy$ we mentioned no one particular proposition of this form; and we only need to introduce $(x,y)\phi(x,y)$ for all $\phi$'s in any way which makes the sense of these propositions dependent on the sense of all propositions of the form $\phi(a,b)$, and thereby the justification of our procedure is established.

## V. Principles of Symbolism: What Symbolizes in a Symbol. Facts for Facts

It is easy to suppose only such symbols are complex as contain names of objects, and that accordingly "$(x,\phi).\phi x$" or "$(\exists x,y)xRy$" must be simple. It is then natural to call the first of these the name of a form, the second the name of a relation. But in that case what is the meaning, e.g., of "$\sim(\exists x,y).xRy$"? Can we put "not" before a name?

Alternate indefinability shows the indefinables have not yet been reached. The indefinables of logic must be independent of each other. If an indefinable is introduced, it must be introduced in all combinations in which it can occur. We cannot, therefore, introduce it first for one combination, then for another; e.g., if the form $xRy$ has been introduced, it must henceforth be understood in propositions of the form $aRb$ just in the same way as in propositions such as $(\exists xy).xRy$ and others. We must not introduce it first for one class of cases, then for the other; for it would remain doubtful if its meaning was the same in both cases and there could be no ground for using the same manner of combining symbols in both cases. In short, for the introduction of indefinable symbols and combinations of symbols the same holds, *mutatis mutandis*, that Frege has said for the introduction of symbols by definitions.

It is impossible to dispense with propositions in which the same argument occurs in different positions. It is obviously useless to replace $\phi(a,a)$ by $\phi(a,b).\ a = b$.

It can never express the common characteristic of two objects that we designate them by the same name but otherwise by two different ways of designation, for, since names are arbitrary, we

might also choose different names, and where, then, would be the common element in the designations? Nevertheless, one is always tempted, in a difficulty, to take refuge in different ways of designation.

It is to be remembered that names are not things but classes: "A" is the same letter as "A". This has the most important consequences for every symbolic language.

In regard to notation it is important to observe that not every feature of a symbol symbolizes. In two molecular functions which have the same T-F scheme, what symbolizes must be the same. In "not–not–$p$", "not–$p$" does not occur; for "not–not–$p$" is the same as "$p$", and therefore, if "not–$p$" occurred in "not–not–$p$", it would occur in "$p$".

A complex symbol must never be introduced as a single indefinable. Thus, for instance, no proposition is indefinable. For if one of the parts of the complex symbol occurs also in another connection, it must there be reintroduced. And would it then mean the same? The ways in which we introduce our indefinables must permit us to construct all propositions that have sense from these indefinables *alone*. It is easy to introduce "all" and "some" in a way that will make the construction of (say) "$(x,y).xRy$" possible from "all" and "*$xRy$" as introduced before*.

One must not say "The complex sign '*aRb*' " says that $a$ stands in the relation $R$ to $b$; but *that* "$a$" stands in a certain relation to "$b$" says *that aRb*.

Only facts can express sense, a class of names cannot. This is easily shown. In *aRb* it is not the complex that symbolizes but the fact that the symbol $a$ stands in a certain relation to the symbol $b$. Thus facts are symbolized by facts, or more correctly: that a certain thing is the case in the symbol says that a certain thing is the case in the world.

## VI. Types

No proposition can say anything about itself, because the symbol of the proposition cannot be contained in itself; this must be the basis of the theory of logical types.

It is easy to suppose that "individual", "particular", "complex", etc., are primitive ideas of logic. Russell, e.g., says "individual" and "matrix" are "primitive ideas". This error is presumably to be explained by the fact that, by employment of variables instead of the generality sign, it comes to seem as if logic dealt with things which have been deprived of all properties except complexity. We forget that the indefinables of symbols (*Urbilder von Zeichen*) only occur under the generality sign, never outside it.

Every proposition which says something indefinable about a thing is a subject-predicate proposition; every proposition which says something indefinable about two things expresses a dual relation between these things, and so on. Thus every proposition which contains only one name and one indefinable form is a subject-predicate proposition, etc. An indefinable symbol can only be a name, and therefore we can know, by the symbol of an atomic proposition, whether it is a subject-predicate proposition.

A proposition cannot occur in itself. This is the fundamental truth of the theory of types. In a proposition convert all indefinables into variables, there then remains a class of propositions which does not include all propositions, but does include an entire type. If we change a constituent $a$ of a proposition $\phi(a)$ into a variable, then there is a class $\hat{p}(\exists x)\phi x = p$. This class, in general, still depends upon what, by an *arbitrary convention*, we mean by "$\phi x$". But if we change into variables all those symbols whose significance was arbitrarily determined, there is still such a class. But this is not now dependent upon any convention, but only upon the nature of the symbol "$\phi x$". It corresponds to a logical type.

There are two ways in which signs are similar. The names Socrates and Plato are similar: they are both names. But whatever they have in common must not be introduced before Socrates and Plato are introduced. The same applies to a subject-predicate form, etc. Therefore, thing, proposition, subject-predicate form, etc., are not indefinables, i.e., types are not indefinables.

Every proposition that says something indefinable about one thing is a subject-predicate proposition, etc. Therefore, we can recognize a subject-predicate proposition if we know it contains only one name and one form, etc. This gives the construction of types. Hence the type of a proposition can be recognized by its symbol alone.

What is essential in a correct apparent-variable notation is this: (1) it must mention a type of proposition, (2) it must show which components (forms and constituents) of a proposition of this type are constants. Take $(\phi).\phi!x$. Then if we describe the *kind* of symbols for which $\phi$ stands, the which, by the above, is enough to determine the type, then automatically "$(\phi).\phi!x$" cannot be fitted by this description, because it *contains* "$\phi!x$" and the description is to describe *all* that symbolizes in symbols of the $\phi!x$ kind. If the description is *thus* completed, vicious circles can just as little occur as can for instance $(\phi).(x)\phi$ where $(x)\phi$ is a subject-predicate proposition.

We can never distinguish one logical type from another by attributing a property to members of the one which we deny to

members of the other. Types can never be distinguished from each other by saying (as is currently done) that one has these *but* the other has those properties, for this presupposes that there is a *meaning* in asserting all these properties of both types. And, from this it follows that, at least, these properties may be types, but certainly not the objects of which they are asserted.

LUDWIG WITTGENSTEIN

SEPTEMBER, 1913

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## LOGIC IN 1914 AND NOW

ONE of my kindlier reviewers has called me a somewhat dated product of the gas-light era at Harvard. My present historical excursion is not one of sentimental reminiscence. I would not want to go back to 1914—for one thing because it was too much like the present. Bradley and Bergson from different sides were critical of rationalism. Few wanted to be idealists, except at Cornell, where Creighton wrote me, "We do not stand for any -isms, but for the great traditions of philosophy." Ralph Barton Perry asked me if I did not think Royce was trying to forget the Absolute, in favor of a new social philosophy inspired by Peirce, in which we, separate individuals, get to know one another's minds by interpreting one another's symbols. Mead was thinking along the same lines as Royce, and Dewey also, for Dewey was an educator. The pragmatist effort to get away from verbalism had led to such a noisy controversy that everybody was out of breath. I and my fellow students were interested in epistemology. I was reading a variety of authors, such as Dawes Hicks, and the early epistemological papers of Samuel Alexander. Bertrand Russell, from the other side of the ocean, was looking for suggestions from here, and getting out of James points for his theory of perspectives which seemed to me contrary to what James or Perry meant. The deeper currents, though we did not see it, were beginning to run strongly towards naturalism and behaviorism. Santayana, a materialist, thought, wrongly, he stood alone. In epistemology the New Realists were looking for a new way of understanding knowledge, and when the Critical Realists temporarily got together in the '20s, I for one thought them reactionary, and said, "We've tried that before, it is back to the old squirrel cage." Symbolic logic excited little interest, and for economic reasons I had to give up teaching it—to classes of three.

In the spring of 1914 Russell came to Harvard, and lectured on

the *Principia Mathematica,* then supposed to be half finished in three large volumes. I was his assistant, and filled in three weeks awaiting his arrival by explaining the symbols. The lectures were in Royce's lecture room in Emerson Hall, corner towards the Library. I regretted that Royce never dropped in. Russell's other lectures upstairs duplicated his Lowell Lectures in Boston on *Scientific Method in Philosophy.* He assigned the logic students the reading of the *Grundlagen* of Frege—in German: "There is nothing else in any language, so far as I know, that is any good in philosophical logic." He said, perhaps over-modestly, that Whitehead had taken care of the proofs in the *Principia*—"I just told him to prove it, and I furnished the 'jaw' at the beginning of sections in English." Russell was enthusiastic about his new student, Ludwig Wittgenstein, who was thinking in terms of an ideal language, the pattern of whose symbols paralleled what they symbolized. In samples from his papers which Russell passed around were ideas later to be expressed in the *Tractatus,* which finally got printed in 1922. Wittgenstein later rather soured on the ideal language, and found new worlds to conquer in the richness of the great natural languages, such as English and German. He thus became the leader of the recent Semanticists. His collaboration with Russell was over.

Earlier, around 1900, Russell and G. E. Moore had been maintaining the world was made of concepts and propositions and practically nothing more (as in Moore's paper, "The Nature of Judgment," in *Mind,* 1899). "Existence is logically subordinate to truth. . . . Truth cannot be defined by a reference to existence, but existence only by a reference to truth." I once said to Perry, about 1909, that this was absurdly upside down, and Perry surprised me by replying there was much to be said for it. The view has occasionally appeared later in symbolic logicians. It has the interesting corollary, drawn by Russell then, that some propositions are true and some false "as some roses are red and some white." Why do we prefer red roses? By 1914 the whole trend of Russell's thinking was away from any such "Platonism" to extreme empiricism. This was much to the disgust of some New Realists, like Holt, who groaned, "Russell is turning into another damn subjectivist like Berkeley."

Wittgenstein convinced Russell that true and false propositions were to be distinguished from fact; and that there were facts, or complexes, corresponding in the objective world to true propositions, but not to false ones. Russell remarks, "A sense of real existence is needed by the philosopher." Possibilities cannot be worth discussing unless somewhere actually experienced, and then

of course they are more than possibilities. The empiricist and the Absolutist agree that there are no objective possibilities, except as by-products of our ignorance. The positivist nominalist empiricist asks, How can the possible be experienced?

Sitting conversing with Mr. Russell one day in the Faculty Club lounge, I spoke of our writers of Ph.D. theses, who I knew were writing sixty to a hundred pages and more, and so I asked him how long a thesis should be in logic. "Well, if it is good original material, I would say a page or a page and a half." This answer later produced consternation among the candidates. Going on to more technical matters, I asked him what he thought of "existence in a universe of discourse." He said the notion of "universe of discourse" is obscure and confused. You should always state explicitly what you are talking about. For instance, say "Whatever $x$ may be, if $x$ is a geometrical figure, then, etc. Repeat this before each statement." I nodded, but I was not quite agreeing. I might have said I did not see the need for the first clause. Why bring in everything possible, and thus raise questions about the range of the possible? Why not start with the second clause? But especially the repeating before each statement here raised for me a difficulty; I pictured a modernized edition of *Alice in Wonderland,* every sentence beginning, "As Mr. Charles L. Dodgson has said. . . ." I felt the same when I read in Bradley, "The wrath of the Greek gods is terrible—yes, in Homer it is so." If Homer said it, he meant it, didn't he? Why should the logician, as such, criticize?

It seemed to me the elder Keynes, father of Wittgenstein's famous friend, had handled these questions with a degree of finality in his *Studies and Exercises in Formal Logic.* I had quoted the book in the first half year, until the students started quoting it to Russell. Russell dismissed it as "a very old-fashioned book," and drew a laugh at my expense. But Keynes had done a beautiful job on such matters as "existential import," showing you can not save both the sides and the diagonals of the "square of opposition." And incidentally he had made a fundamental pronouncement on "universe of discourse," to the effect that the logician as such has no ontological commitments on what is "existence." But as soon as any speaker opens his mouth to make a statement or refer to one, that proposition or its contradictory will, by the nature of the propositional form, deny the *existence* of some combination or other. What that non-existence is, specifies the universe to which the proposition refers. The user of language is thus forced by his propositions to indicate his universe, and what he means by existence.

What, then, is a proposition? A proposition, for the purposes of this discussion, is *What a statement says.* Wittgenstein has laid down, in his papers, following the general line of Frege, that you understand a proposition when you "Know what would be the case if it were true," and "What the case if it were false"—he does not use the subjunctive. Since one of these ifs is itself false, in understanding a proposition you understand possibilities which are not existences. Propositions are not names, Wittgenstein insisted. A name always points out something that exists. A proposition can describe Berkeley's unknown palm-tree in the desert, without our knowing the individual that answers to the description. So also Russell's famous "present King of France." That also is not a name. In fact, in 1914 I immediately assimilated Wittgenstein's theory of propositions to Russell's theory of descriptions, and regarded it as a mere accident that Russell's descriptions were limited to what Royce called "classes of one." I also thought that when you verify a proposition by observation, the proposition can thereafter be used as the "name" of the fact that verifies it, with some qualification about completeness of confirmation. But a proposition is intelligible when not verified, as well as when it denies the fact exists.

I understand Carnap as holding recently that you always talk within a universe of discourse, but it would be "metaphysics" and "meaningless" to even raise the question of the relation of existence in one universe to existence in another. I do not agree. In the case of painting Mrs. Langer has said, "So long as you see the paint, you don't see the picture. They are not even in the same space." As you read a great work of fiction, do you not likewise forget the print, the sentences, as you absorb the thought? There is an overlap, for the sound of the poetry is part of the poem. Is Carnap saying art galleries and poems are meaningless metaphysics? It does not follow that there is one all-inclusive universe in the background. To describe all possible objects of thought, or Leibniz's all possible worlds, one would have to say that for every true proposition its contradictory was also true, and this is self-contradictory. But even Russell used to admit that there were other universes than "the long second best of this our actual world."

More prominent in our 1914 discussions was the question, "Are there negative individual facts?" Russell says he asserted this in 1914, and nearly started a riot. As one of the chief rioters, let me try to explain. I did not deny a negative side to the world, I emphasized it. I believe in negative universal facts, but not in negative individual complexes. To observe them, you would have

to observe what is not. Are there facts in the external world such as "The center of the moon not 100,000 miles from the center of the earth," and "Not 101,000 miles," and "Not 101,000 miles and 310 yards"? If so, the world is full of rubbish. But then Russell asked, "What does the negative proposition stand for?" This would be a good question if the proposition were a name. Russell and Wittgenstein were holding that a false proposition had no object, but a false proposition is not therefore a meaningless one. Tarski later said the equivalent of " 'The book is on the table' is true (presupposes) the book is on the table." But how about "The book is not on the table?" Tarski does not say. I would say, with Russell, if "The book is on the table" is false, it has no fact corresponding. The-book-on-the-table does not exist. What then happens to the proposition, " 'The book is not on the table' is true"? It refers to the same case. The-book-on-the-table does not exist. There are described complexes that exist and others that do not exist. After you have verified that the proposition does refer to a complex that does exist, you can even use the description as a useful name for that complex. When the complex does not exist, then the proposition is a universal proposition which refers truly to that case: "There is not such a complex of characters." This reduces propositions to two sorts, particular or individual affirmative, and universal negative. To avoid a quibble, let us remark that Russell would be quite justified in saying, "It is a fact that there is no fact corresponding to a false proposition," and also in ignoring the common use of the word "fact" to mean "supposed fact," as in "the former fact that the earth was flat."

But how are we going to verify a "negative fact," if it is an absence? A member of the 1914 group, Raphael Demos, suggested in substance that a negative statement is to be interpreted as meaning, "There exists and is observable some (unspecified) fact inconsistent with the truth of the positive statement." Taken ontologically this is Spinozism, but taken as our reason for knowing, it is open to the criticism that we do not really *mean* to say this. But it does seem to fit our evidence for it. We look and see the book yonder on the bookcase, or the uninterrupted surface of the table, and we say, "The book is not on the table." But inconsistency or incompatibility of positive facts is also not to be perceived by the senses, though I believe there is such a thing as non-compossibility. This is just another of the limits of pure empiricism.

Mr. Russell was emphatic in 1914 and later that the term "existence" must not be applied to the immediate. It seems awkward to refuse to apply the word to the supposedly most indubitable case of it. Why not say "Existence is this," as one might say

"Red is this," or "It is raining," or "Oh, boy, this is living!"? This is giving names, rather than asserting propositions, but it is important, and pretty uncertain the first time around. But you want to tie your words to experiences, and language is also social. As such, names may be misused, for as Aristotle noted, "The child calls all men father." Hegel concludes the child starts with the universal, and will reach the individual later. It seems to me the child starts by being muddled. The first names are vestiges of bodily conditioned reflexes, and are "vague abstractions," contrasted in diametrical opposition to the exact abstractions of rational thought.

I heard Pierre Janet lecturing in Paris in 1911–12, about the beginning of language in bodily gestures. He mentioned we fall back on gestures when we go abroad. Misled by this, I thought of Peirce's theory of signs, and of some gestures as indices, such as pointing; others as icons, the imitative gestures. But I was wrong, for these gestures are not primitive. Try to point something out to a dog, or get him to imitate you! Pointer dogs "freeze" but they do not point; apes do not ape. But you get real communication by gesture when you reach for your hat, and the dog runs eagerly to the door. He knows what it means (not what you mean). Primitive gesture language is a transaction and a coöperation, in which as Janet said, "The chief did not know he was commanding, and the follower did not know he obeyed." In the course of time there may have been sounds uttered, which got associated with habitual gestures. Because the sounds can leave the hands free for other duties, they proved profitable as substitutive signs. The sounds were whole "sentences," undivided and redundant, arbitrarily associated with the gestures. So far we may go with Janet. But so far we are not yet in the realm of conceptual thinking. Later came the breaking of sentences into words, which can be recombined while retaining a constant core of meanings. This was a discovery comparable with the discovery of printing by movable type. You had symbols for the possible in the new combinations.

Thinking itself can be pre-linguistic and pre-conceptual. To think is to have some grasp of possibilities not at the moment actualized. Mr. H. H. Price's cat, who sizes up the situation, the apparently sleeping dog across the way, the tree and the wall offering means of escape, before she ventures on the milk, is doing a bit of thinking. Language with its words enables one to free oneself from the moment still further, and preserve for the future any insight acquired. You begin to think conceptually not when you generalize, for nothing is easier than to generalize and be

vague. Seeking for law is not generalizing, but the discrimination of the essential from the accidental. You begin to think when you compare and discriminate, and begin to note alternatives and negative cases. Dewey did much to make us all aware, that in thinking, whether popular or advanced, there was a use of hypothesis, deduction, and verification. Hypothesis is a guess, a possibility imagined. Deduction is getting a hypothesis ready for testing by showing what testable results it would lead to, if it were true. It is a great mistake to think that testing is observation. Observation is just getting the facts into usable form so that they can be compared with the results of deduction. Observation of the real is always surprising. You are pursuing an analogy of two parallel structures, molding the hypothesis and its consequences to match the novelties of factual interrelations. Formally, you are affirming the consequent even when you find your deductions confirmed. Actually, as Duhem and others have emphasized, you are almost always paralleling a whole set of hypotheses with a system of facts. You can solve problems with less and plunge back into unintellectualized experience, but you can not learn from experience with much less.

It was a source both of strength and of weakness in John Dewey that he saw mathematical physics at a distance, and the ordinary man's problem-solving close at hand. He saw a kinship in all thinking, but made thinking too purely instrumental. I recall a meeting in 1918 of the informal philosophy group which gathered from time to time at Columbia University in the Faculty Club. I recall the date because Norman Kemp Smith was there from Princeton, and told me he had just been invited to take the great professorship at Edinburgh. It was the only time I met him. Another was Dickinson Miller from Smith, and Morris R. Cohen I think from City College. Lovejoy could not make it. The Columbia top professors were present, Dewey, Woodbridge, Montague, and others. It was a real meeting of minds, and I was glad to be invited. After lunch Dewey read the paper of the day, and a general discussion followed. Dewey's paper was on a favorite subject of his, *Logical Entities as Inventions*. I do not recall that Dewey gave many examples of logical entities, but it was in the spirit of the times to cite the AEIO propositions of Aristotelian logic, "the deductive-system form," and especially the points, straight lines, and perfect circles of geometry. I think Dewey would have included many others. They were not eternal perfections, but were invented as tools. They were as much manufactured as automobiles. I remember I wanted to know whether they were made out of nothing, and if he thought we could postu-

late them in any way we pleased. "No more than an automobile, and no less," he replied. Automobiles in those days were even more unruly than now, and had to contend with roads that were two grooves for the wheels and a groove for the horse, with continuous raised mounds of gravel between. You took your monkey wrench along, and "get out and get under" was a regular part of motoring. I said, "Cars are made of steel and rubber that have ways of their own, but what are logical entities made of?" "Not nothing," he said, "but the materials of experience, refined and tested for a special use"—I quote approximately. Professor Montague wanted to know whether a pile of grain did not have a mathematical volume of so many bushels before we thought about it? Dewey replied he would grant a certain cubic volume, but the "bushel" was invented by men—in fact, that was a very good example. Kant seems to be saying "what we *make* we know through and through," but that is not so.

There were always some aspects of Dewey's philosophy which troubled me. He spoke of the data of experience, and how they were worked over into a better synthesis. I wanted to know "Whose experience?" All the "experiences" I knew about were what somebody knew in the midst of a larger "situation," most of which remained not fully experienced and not made over. Secondly, thought, for Dewey, was something called up to solve a temporary problem, as you might call the fire department to put out a fire. The main problem for him seemed to be to avoid so many false alarms and work hereafter only on real fires. When the fire was out you went back to the firehouse, and smoked a pipe and played cards and slept. But it seems to me that good thought goes beyond solving temporary difficulties. It is the development of culture itself, and if it broadens down from precedent to precedent, it does continue and broaden. I am not sure Dewey really meant to deny this—he said later that if he had it to do over, he would speak of the development of culture, rather than the adjustments of experience. I do not think he wanted to take a step from thought as instrumental to the world as irrational. Thought might shorten up trial and error in figuring how to go somewhere, but I argued that really "practical" judgments were those that went on to conclude, by comparison of various ways, which way was the better, so thought ended not in unimpeded action but in careful comparison.

Royce was troubled by William James's apparent surrender to irrationalism in his praise of Bergson. So he wanted to know whether James's Radical Empiricism was a return to unintellectualized experience. This would be like returning to eating your

food raw. In the spring of 1910 he invited James one afternoon to come to Emerson Hall C, and hear such views annihilated. I recall James, in what was probably the last argument between them, finally interrupting. Leaning towards Royce, he put his finger down on the table and said, "But Royce, you get me wrong. I am not opposed to thinking. I like my food cooked, provided you do not cook the flavor out of it. By 'Radical Empiricism' I was not meaning raw experience, but a view that there is much more in experience than some have been willing to grant. What we meet with in experience may be things that have other connections, and not made of something called 'consciousness.' I did not use Dr. Sheffer's term, 'neutral entities,' because I did not happen to think of the term." As Sheffer modestly blushed, James excused himself, as not feeling well, and was followed out the door by an immediately worried and solicitous Royce, who returned to say he hoped James had not over-exerted himself.

James's attitude towards any "stuff" called consciousness led me to wonder if there is any such thing as immediacy, except as a matter of degree. Pure infallible surface immediacy is an illusion, our experience always has unplumbed depths. I may often be in error about what is immediately before me; a moment later I may more correctly discriminate what has all along been really there. Most people would say at once, however, that knowledge by propositions is not immediate knowledge. But propositions have three levels: the words, the sense, the fact meant. Both the first two can be immediate, though one of them can be thought of without the other. I can lose myself in the sense, and forget the words. The fact meant is supposed to become immediate in verification. But it does not follow that getting to the fact meant is the sole or even chief aim of the user of propositions. Santayana made all our experiences epiphenomenal, and talked of our bridging the gap to fact only by a fiat of "animal faith." I think the relation of propositions to fact is more like "business credit." A "propositional function" is like a blank check; you write the check and it is a "proposition." You "believe" it, that is, you sign your name. Somebody cashes it, that is, he "verifies" it. But the cash may, in the case of an ordinary check, be a bank note, which is more credit, or gold and silver, which is still credit, and to get away from credit, you would have to come down to primitive barter, and the collapse of the economic system. And so with propositions: we think in propositions, but only now and then do we get worried and verify. For Santayana there was no verification, no way to get across. Even immediacy gives us no truth, "nothing immediate exists." He says what we experience im-

mediately are unchanging "essences." When I heard this in his Metaphysics course, which he gave once, in 1909–10, I wrote a paper asking: whether the essence of change changed, or the essence of fire burned, or the essence of the microscopically minute was very small? If not, what claim had they to be the essences? Without mentioning my name, Santayana picked up my paper before the class and said: "What I mean is something more ethereal. This criticism is so external. When I read such logic-chopping, I ask myself, 'Why does this young man want to study philosophy?' " Alas! the analytic "philosopher" is not appreciated by the intuitionist.

In the time around 1910 the New Realists were prominent. They thought of it as wanting to live in the world, and not inside their skulls. They had looked to Bertrand Russell. But they thought in terms of "things," such as dogs and houses and hills, and a man as a physical organism. So when Russell in 1914 lectured on perceiving a dog as a "brown canoid spot," he was breaking with them, and taking up a "neutral monism" which thus came to seem to many to be the genuine New Realist view, and to suggest Hume. It was not Hume, for Hume talked about the constancy of behavior of billiard balls, not of red and white spots. Think of trying to work out the laws of red and white spots—let alone "brown canoid spots"! James had intended to discuss a "neutral pluralism," not a reductionism to one *sort* of content. Perry was interested in behaviorism, then just on the horizon, particularly as centered about the human physical organism. I remember saying to Perry, "You have attacked the 'ego-centric predicament,' but now you seem to be getting yourself into the 'organism-centric predicament.' " He replied, "The ego-centric predicament is a dodge, but the organism-centric predicament is a fact." Like Spinoza I doubted whether we could never get out. But the era of the "organism" was with us for a long time to come, even though Russell was saying "Things (presumably including human bodies) were an invention of our barbarian ancestors." "Operationalism" was just around the corner, with its test-tubes and thermometers, and its theory that all questions are to be settled by bodily movements—a view Russell's barbarian ancestors might have approved of.

In Russell's logic classroom in 1914, Russell found reason to complain to Perry that his lectures were being received too passively. So Perry tried to stir up some of the students, such as Raphael Demos and Albert Perley Brogan, later Graduate Dean at the University of Texas, to do something. Instead of interested inquiries they launched into criticisms. Brogan wanted to know

whether there were simples, and why not infinite divisibility—"fleas have smaller fleas that on them prey," as Leibniz had held. Were there then atomic propositions? Russell so frowned on this that he scared Brogan into temporary silence—though later Russell was to reconsider the question. And Brogan reconsidered the silence rather soon, and wanted to know whether Russell was not shaping his symbols to fit his metaphysics. Russell vigorously maintained his symbols kept him from going astray.

One thing Russell kept repeating at this time was that the ultimate truths of logic could not be stated in propositions. "Logic is the science of ghosts, which deals with unmentionable things." What he later rather allowed could be said in a "meta-language" he then insisted could not be said at all. Try to state the law of contradiction in a proposition. Then, as a proposition it has a contradictory. But what is the contradictory of the law of contradiction? Again, the distinction of the epsilon relation, of individual to class, from the inclusion relation, of class to class, Russell characterized as one of the great achievements of modern logic. (Russell followed an English custom of saying "ep-sigh-lon." "The ignorant man," said Mrs. Ladd-Franklin, when I told her.) So a class is never a member of itself. But you can not even say it. For then the class of those classes which are not members of themselves would be a member of itself. In the *Principia* the theorem: "*1.1. Anything implied by a true elementary proposition is true," is put in English, not because you *can* say it in English words, and not in symbols, but to indicate you can not say it in either language. Russell thought you could not say these without getting into crazy whirls, and I still think there is much to be said for this view. Later I think Russell got disturbed by Wittgenstein's mystical extensions of "If you can't say it, you had better be silent." So he fell back on a metalanguage command, "Don't misuse symbols—don't ask why!" The proposal to make the rules of logic fiats of will reminds me of Margaret Fuller's "I accept the universe," to which Carlyle gave the only reply, "Gad, she'd better." In 1914, in his seminar on logic, Royce read us what was to be a last letter from Charles Peirce. It was to Professor Frederick A. Woods of M.I.T., who had written, "Things equal to the same thing are equal to each other, and therefore. . . ." Peirce said, "Please, man, don't use your principle of inference as a premise, as if it were a proposition." Royce quoted from Augustus DeMorgan and others, and added from Gilbert's *Bab Ballads* the sad case of the young curate, who "Proved by the rules of Bishop Whately, that what is true of all is true of each one

separately." I still think Russell was right the first time—some things you really can not say, like denying the law of contradiction.

Let me now try to formulate a rather unsayable thing about the "reference" of propositions. In those days I used to illustrate to students the William James point of view about reference by the case of the proposition, "The cathedral is white." Suppose you asked James, "What cathedral do you mean?" He might reply, "Starting here, where our bodies are now, if you go three blocks that way, and then two blocks to the right, you will reach it, and then you can confirm whether what I say is true." The meaning of the proposition (in the sense of its "reference") is the method of its verification. Operationalism in America took off from here.

The problem of reference is one case of the general problem of identification. You walk off with somebody's hat, or try to break into his automobile, mistaking it for your own. So in propositions you describe the rose as red, when it is red in fact only under conditions $x$, which themselves hold only under conditions $y$, till a Bradley insists every proposition involves the universe, and there is no reference to single fact. Royce argued in his early philosophy, that since the object of error is the same as the object of truth, you have only to develop the true "inner meaning" of your mistaken thought to arrive at the universe as known by the Absolute —you had meant His vision all along. In his later social emphasis, Royce noted that one man's symbols call for interpretation by another, and, as Peirce had indicated, this called for further reinterpretation. Your mind grows by interpreting the products of other minds, and particularly when the other mind is opposed to yours, or brings you knowledge which you would not have thought of without his help. It is in this way that you learn other minds exist, though they are beyond simple sensory verification.

There is some danger here of losing the simple sensory facts in so much interpretation. In statements about past facts which can no longer be observed, Woodbridge told me he often tried to pin Dewey down, as to whether these could be altered by later interpretation. He tried to make Dewey grant a core of past facts now unchangeable: "The moving finger writes, and having writ moves on." Woodbridge argued, "Supposing there is an evolution, you can not have the beginning of the evolution also evolve without upsetting the whole idea of time. But Dewey wanted to reinterpret this, until I didn't even know where my question had gone to." Royce and I argued about future facts. Royce insisted the truth about the future is even now true. I replied that if the truth of the proposition is not a quality inherent in the proposition, but a relation of it to a corresponding fact, you can not have the

relation until the fact has itself taken determinate shape. You can make a truth-claim about the future, you can say the proposition will be either true or not true from the double nature of propositions, but you can not say that you can break the "either-or" as yet. Both sides have to be determinate. A supposed proposition may be so indeterminate that no fact could confirm it. Consider, for instance, that ideal motto to be put over the door of a college chapel: "The divine is rightly so called."

The easiest way to reach truth is to be vague in your reference. I am surer that "an animal" crossed the road, than that it was a "fox." But we do not want truths gained so easily, particularly in science. We want the "particular go" of it; and that sort of truth, said Thomas Henry Huxley, comes sooner out of straight error than it comes out of vague generality and confusion. A scientist often pursues a theory which he knows is wrong somewhere, if it gives definite leads, though he is always glad to get a sharp test between one theory and another. Questions of weighing certainty and probability play a bigger role in "philosophies of science" produced by philosophers than in the work of the scientific inquirer.

Wittgenstein in 1913 had been looking for a symbolism which would be a map of the facts it was symbolizing. So he said the commutative law $ab = ba$ was merely a warning that the order of the signs did not symbolize. In $aRb$ there were not three terms which would need to be connected together by additional relations, as Bradley had argued, as his chief stock in trade in *Appearance and Reality*. $R$ was just an index, which pointed to the fact that the relation of $a$ to $b$ on the page symbolized a relation in the fact referred to. In 1914 I tried to find a way to symbolize negative propositions, though I did not get my problem over to Mr. Russell. One day, as we were crossing the Harvard Yard, he said, "A relation takes terms in two different ways, positive and negative, and that is all there is to it." This did not seem to me to make sense. I was saying to myself, "If $aRb$ is false, then the relation does not relate the terms and is not there at all, for a relation is not a relation unless it relates." So in this case there are only two objective components, $a$ and $b$. I was also holding a relation to be as individual, when it did relate, as the terms it related, though Russell had denied this in the *Principles of Mathematics*. So if The-saucer-is-not-on-the-book, there is nothing objective there but the saucer and the book, only two of the supposedly three-component complex. But if The-saucer-is-on-the-book, this analyzes into the saucer, the book, and the relation of *being upon*. But given these three components of analysis, you

can not reconstruct the complex. You cannot be sure whether the saucer is on the book, or the book is on the saucer. The order of subject and predicate is itself symbolic, but symbolic of what? Not that the one is the predicate of the other. It is symbolic of something which is only there when the complex exists as a complex: the saucer, the book, the relation of *being upon*, and *the complex*. In this simple case we see a general rule, that synthesis is creative of something new. So the objective fact contains either only two unrelated constituents, or four components. I said to myself, "I am like Royce's angel." Royce was considering John Stuart Mill's conjecture that someone might come from a far country, who said that where he lived two plus two always equaled five. And Royce commented wryly, "If even an angel came to me saying, 'Where I come from, two plus two equal five,' I think I should know at once where he came from, and what sort of an angel I was dealing with." But here we are putting three things together and getting four. I asked Royce about it, and he agreed that in this case it was true. Is synthesis always creative, even in deductions? And how get an adequate symbolism?

You may say that a deduction can only develop analytically what is already there. It is like a brickmason building a house. He performs the same operation over and over, brick on brick—"tautologies." But you have forgotten the architect. There is a lot of architecture in a whole book on the triangle or the circle. A deductive system is a construction, not a piece of stuttering. Royce himself has said, "It was a great mistake on the part of Mill to suppose deduction is begging the question because it is applying an enumerative universal to a case already included in the enumeration, as in concluding 'Socrates is mortal.' A deduction can give you new knowledge, which no examination of the premises taken separately will reveal."

Russell's own philosophy at the time was full of constructions and correlations between constructions. Frege had constructed "the number two" out of pairs of objects, assuming a more or less limitless supply of such objects, though he himself recognized that number applies to real existents only "under a concept." The tree is one as tree, but many as roots, branches, and leaves, and enormously numerous as atoms. Berkeley had noticed the same; it goes back to the Greeks. The Frege "number two" looks like one of Dewey's inventions, and perhaps not even a necessary one; it is not the number two plus itself over again which equals four. But how about a "point"? If we are going to have exact lengths, we need straight lines, which must terminate exactly in points and not be fuzzy on the ends. Whitehead and Russell both try to

bridge the gap between empirical sense and exact mathematics by a construction, replacing a point by a set or series of areas or volumes converging on the point. The construction can be done, but it has never seemed to me to eliminate the point. You cannot make the series converge, unless each member fulfills the requirement, "It contains the point." So you have to use the point as part of the definition of what is to replace it. And an infinite series is not empirically observable anyway. In the calculus you can define a series of velocities which have, as a limit, that strange piece of metaphysics, "The velocity at an instant." If you had a perfect speedometer on your car, you could get it displayed on the dial, and it would be exact, though *impossible!* For here the series is not defined in terms of the instantaneous velocity itself, so the construction is good!

But now I come to a point where I was drowsing in 1914, and so was everyone else. Royce might have said, "When the argument looks obvious, that is the time to get suspicious." Russell stepped to the blackboard, and wrote a sentence, like "The book is on the table." He said, "Now let us generalize, as in algebra." Let us write "*aRb*," where "*a*" stands for "book," and "*b*" stands for "table." Then we can generalize further, and write "*xRy*." I should have been noting that algebra is less fundamental than arithmetic. Royce did say at the time, "Propositions are complicated things. Why should Mr. Russell start with them? And why start with the language of a subject, rather than with the subject itself? And Russell is using $p$ and $q$ in a way to conceal the complexities." And Russell himself was saying, about the first pages of the *Principia*, "*Either-or* is not an objective relation occurring in the outer world." To put the point briefly, in generalizing to get "*xRy*" you were not generalizing at all. You were throwing out the kernel and leaving the husk. You were throwing out the baby with the bath. You were dropping out the facts symbolized, and the symbols as symbols. You were retaining only the factual structure of the symbols as tokens without meaning. No wonder what you had left was syntax, perhaps a rather arbitrary syntax. The relation between facts drops out, and with it goes the extremely important consideration of relevance. You get, of course, logical atomism. You are generalizing away the transitivity of objective relations, and the basis for relevant and strict entailment. Problems of reference are gone, for the "symbols" no longer refer to anything beyond. Problems of universals disappear, and you have left only an $R$ or an $S$, $\phi$ or $\psi$. Truth and Falsehood disappear as relations between language and fact, and $T$ and $F$ are adjectives of $p$ and $q$, and as such retain only a

shadow existence. Existent individuals with their many potentialities disappear, and are replaced by little marbles all alike that you manipulate in "set theory." You have a completely external calculus, and you grow impatient of "intension." So Wittgenstein turned to Semantics.

The New Realists, except Spaulding, cared little for the developing science of Symbolic Logic; Montague was positively hostile. But they all had hoped that Russell would work out for them a new relational logic, to replace the substance-attribute, subject-predicate logic, which they felt had cramped and misled philosophical development. On this side I was very sympathetic. I thought the analysis of symbols, of beliefs, of probabilities, was highly beneficial, and the development of Symbolic Logic a great achievement, of which I questioned only some of the supposed foundation stones. But what was needed most, as I saw it, was a theory of the natural world, or of the whole world, as built up of networks of relations in systems. I thought many of these objective relations were *internally related* to other relations, falling into systems, some that were tight, other systems that were looser, and there were other cases, cases of irrelevance, where the relation between relations was accidental. This was the true question of internality of relations.

Aristotle, dealing with predicates, developed one of his most influential and valuable doctrines, that of The Predicables. I agreed with Joseph, in his *Introduction to Logic* (1906, 1916), that Aristotle meant the relation of predicates to each other, the lowest predicable being "Accident" and the highest "Definition." Porphyry messed things up by thinking the question was the relation of predicates to subject, which launched the Middle Ages on the unnecessarily confused "Nominalism" controversy. "Being bald-headed" is not an Aristotelian "accident" in relation to Socrates—but it is an accident in relation to the concept of "man." Following a wrong lead, Scholastic Philosophy turned relations into predicates, and accidents into second-class predicates, so that a "Substance" had its "essence" and its "accidents." It would be better to say some predicates are internally or essentially related to others, as Aristotle really held, and especially that some relations are essentially related to others, because they form a system. Relations are not predicates of the terms related. You could know a relation without knowing the full system to which it belonged. There is no one tight universal system, as in Absolutism; no complete irrelevance, as in logical atomism. An individual existent is the place where many systems meet, and tends to become a center of spontaneity and novelty, since no one system can deter-

mine the outcome. That is why, also, analogy between individuals is so weak. A notable character of some objective relations is transitivity, which is not primarily a relation of symbols. If the money is in my purse, and the purse is in my pocket, the money must be in my pocket. This is not a deduction from a law—it is true in the individual case, and the law is a deduction from it. I do not know such things by inner intuition; if it were a matter of my thinking, I could readily think otherwise, as many people have. I know it by observing the facts, though not with the senses, for there is something here in the world the senses can not see; it is not in me, it is in the facts, and I am an empiricist observing objective possibilities. I may be told that Hume had already upset all that I am arguing for. Hume, in a famous summing up, declares that we never perceive any real, that is to say essential, relation between distinct existences, for we can always imagine one removed, and the other still there unchanged. He makes a good point as regards observation, but not as regards experiment. As a good empiricist, Hume ought to show that we can actually experimentally *take* the one away, and leave the other unchanged. Hume is the apriorist, opposing experimental test and the method of difference. I can of course *imagine* the table removed, and the book just where it now is. But can I *move* the table, with like result?

The situation with regard to analogies is very curious. No doubt people often misuse them. I am disposed to believe that in most people's thinking analogy plays a greater part than deduction, and maybe justly so. In the logic texts today, however, analogy gets a grudging paragraph, with an example such as: "That young man was agreeable and a good talker; he turned out to be a crook. This young man is agreeable and a good talker; he will turn out to be a crook." But that is to draw an analogy of predicates of the individual, and the predicates of an individual are only loosely connected. The good analogies are analogies of systems of relations, the systematic analogies. For instance, all professional men think in analogies. Lawyers do, and call them "precedents." They dislike codifiers, like Bentham, who want the law reduced to simple, clear principles. In the Common Law of England principles have no authority, only precedents. In the Civil Law of Rome, the Canon Law of the Church, the Great Lawyers of the Roman Empire, the Popes with their decretals, state supposedly only principles. A statute lays down the principle which is to be the law of the land. What do the lawyers do? They wait around to see what the courts begin to decide as concrete cases come up, to see what the words mean. The law broadens down from inter-

pretation to interpretation. In medicine the most valuable practicing physician is he who can make a proper diagnosis. Diagnosis is the ability to bring up the most relevant analogies from previous cases. This is what *learning by experience* comes to, here and in engineering, and the other professions. One must preserve open-mindedness and flexibility in using analogies, and a hasty analogy may be dangerous, but that is because analogies are important.

You say it is different in a deductive science, for instance mathematics. Putting the finished results in deductive system form, like Euclid, is of value. The logical form convinces others, as Aristotle says—particularly, he adds, if the middle term gives the "cause," by which he means "the essential." But the scientist feeling his way forward is delighted to find the help of analogies, the cross fertilization of parallel systems. Consider Descartes' great achievement: the analogy of algebra and geometry. Consider the proofs of parallelism between Euclid and the non-Euclidean systems: a contradiction in the one meant a contradiction in the other, which forced mathematicians to take the non-Euclidean seriously. Analogy (relational analogy) originally meant *ratio:* that is, we reason C will be to D as A has been to B—either exactly, or more or less so. Inductive discovery may need the insight of genius to pick out what are the essential key relationships to be compared; but such inductive discovery is then thought out, and due to something more than lucky chance.

The certainty of practicable formal deduction is an illusion, said Alfred Sidgwick and other English pragmatists at the beginning of this century. Given a rule about murder, the real problem was, "Is this a case within the meaning of the word 'murder'?" "Combinations in restraint of trade are illegal"—granted, but would it be a fallacy of accident to bring this or that case under it? Deduction has great use in developing, perhaps mathematically, the consequences of an hypothesis, which at first is a guess. It is a formal fallacy to affirm that the consequences have been found, and so the hypothesis is true. But that is not all. Only something analogous to the consequences has been found. You know you have reached the observed facts when you hit something not neatly packaged to answer a question, something complex, surprising, deficient, and redundant, full of dormant potentialities, hard to measure. This is what "existence" looks like to the scientist. The hypothesis has rival hypotheses to be thought of, and then eliminated. In one experiment you test not one hypothesis, but a whole system of hypotheses, as Duhem (1906) and more recently Quine have pointed out. The whole thing becomes a systematic analogy on a grand scale between a big collection of facts and a big system

of theory, and a molding of many hypotheses to make the analogy closer. It would be singularly unsatisfactory at this point to really have to work with a theory of deduction which says that both "The moon is made of green cheese" and "Columbus discovered America" imply "Diamonds are hard." This would be so remote from the problems of relevance, transitivity, discrimination, that its self-praise, "We don't know what we are talking about, nor whether what we say is true," threatens to become only too accurate! Not much wonder Wittgenstein went over to the Semanticists. The formal (apparent variable) implications of the *Principia* are merely bundles of such material implications.

It is perfectly allowable for the symbolic logician to start from any postulates he chooses, and give any definition of implication he chooses, in his own mathematical science. I admire what has been done in a great new subject, and hope they do not become too involved with IBM machines. I also think there is much room for a study of natural languages, and especially taking natural languages at their best. Russell is a bit unfair in calling the new Semantics a study of "what silly people mean by the silly things they say." Not all sentences are propositions: there needs to be a study of the different kinds. One can consider meanings of words: much has been done from the Sophists and Socrates on. An inductive study of interesting samples runs some risk of little continuity. "The dictionary would make very good reading, if it did not change the subject so often." Immersion in such inquiries may incapacitate for extended coherent thinking—the "silly people" may get you.

When I read Husserl's *Logische Untersuchungen* in 1913, Husserl's attack on "psychologism" in logic,—knowing Royce, as in his essay in the *Encyclopedia of the Philosophical Sciences* I (1913), with his idea of logic as the general "science of order,"—seemed to me more "old hat" than it would seem now. (This last sentence looks like Husserl plus Royce.) But Husserl's subsequent inquiries I found most interesting, on the subject of meaning, though Albert Chandler, Russell's other Harvard assistant, who had studied with Husserl, and M. R. Cohen disagreed. A brief analysis by Husserl of the German usage of "Vorstellung" and "Idee" led me to make a list of thirty-five meanings in English of the word "idea." Royce chided me for not bringing the list to his logic seminar: "Such questions are of great philosophical interest, especially to the logician." I regret I have now lost the list! I was fascinated by the great Oxford Dictionary, and all the meanings and "metaphoric" uses of single words, their growth by analogy. You "break out of jail" or "into applause," you "break out a boat from the ice" or "the glass out of the window,"

or just "break out with the measles." A verb like "to take" may have five hundred or more meanings. One smiles at the naive philosopher who says: "One word, one meaning."

I conclude that the Semanticists have a good field, but on the border of philosophy. I admire the Symbolic Logicians, and the "quiz-kids" who argue in their meetings. What I have written here, except some points about analogies, was known to me in 1914, the year when Charles Peirce died, the only man, I believe, to write "logician" as his occupation in *Who's Who*. I have written autobiographically, so as not to seem to speak for others back there. I think it is still of interest, for philosophy is often the repeated rediscovery of what was thought often before.

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## RUSSELL'S PORTRAITS AND SELF-PORTRAITS FROM MEMORY

FIVE years ago Bertrand Russell turned eighty. At that time he reminisced in these words:

> My work is near its end, and the time has come when I can survey it as a whole. How far have I succeeded, and how far have I failed? From an early age I thought of myself as dedicated to great and arduous tasks. Sixty-one years ago, walking alone in the Tiergarten through melting snow under the coldly glittering March sun, I determined to write two series of books; one abstract, growing gradually more concrete; the other concrete, growing gradually more abstract. They were to be crowned by a synthesis, combining pure theory with a practical social philosophy. Except for the final synthesis, which still eludes me, I have written these books. They have been acclaimed and praised, and the thoughts of many men and women have been affected by them. To this extent I have succeeded.
>
> But as against this must be set two kinds of failure, one outward, one inward.
>
> To begin with the outward failure: the Tiergarten has become a desert; the Brandenburger Tor, through which I entered it on that March morning, has become the boundary of two hostile empires, glaring at each other across an almost invisible barrier, and grimly preparing the ruin of mankind. Communists, Fascists, and Nazis have successively challenged all that I thought good, and in defeating them much of what their opponents have sought to preserve is being lost. Freedom has come to be thought weakness, and tolerance has been compelled to wear the garb of treachery. Old ideals are judged irrelevant, and no doctrine free from harshness commands respect.

The inner failures to which Russell then confesses concern in part disappointing shifts in his own theoretical philosophy, such

as his failure to find religious satisfaction, and in part painful frustrations of his hopes for men: "I set out with a belief that love, free and courageous, could conquer the world without fighting. I ended by supporting a bitter and terrible war. In these respects there was failure."

Balancing off successes against failures, Russell then concludes that he is still conscious of something that

> I feel to be victory. . . . I have lived in the pursuit of a vision, both personal and social. Personal: to care for what is noble, for what is beautiful, for what is gentle; to allow moments of insight to give wisdom at more mundane times. Social: to see in imagination the society that is to be created, where individuals grow freely, and where hate and greed and envy die because there is nothing to nourish them. These things I believe, and the world, for all its horrors, has left me unshaken.

This moving confession of personal faith is but one of thirty-two items found in Russell's latest book, *Portraits from Memory* (New York: Simon and Schuster, 1956, 246 pp.). In this collection of essays we are treated to four kinds of Russell reveries: autobiography; pen portraits of contemporary greats known personally to Russell—from Queen Victoria and John Stuart Mill to Wittgenstein; wise counsels, such as advice on how to grow old gracefully; and philosophical essays.

Thus there is something here for everybody. The book will delight philosopher-kings, already acquainted with its author's philosophy, for there is lots of gossip in it, but properly elevated. Commoners, on the other hand, will be equally charmed, for they will find the philosophical wit and wisdom of Russell abundantly in evidence, and never failing to bring forth chuckles, at times even belly laughs. Only his atheism is missing; thus the author has here denied himself one of his favorite topics for witticism. But it is likely that in this one respect at least the book will have a wide appeal to the general run of philosophers and to commoners alike.

## I

In his portraits of others Russell reveals himself as clearly as he reveals the men portrayed. It is common knowledge, for example, that Russell is not a humble man. But in his sketch of Bernard Shaw we find that he would not care to be humble. He praises Shaw for attacking

> Victorian humbug and hypocrisy. . . . It was a part of Victorian humbug to endeavor to conceal vanity. When I was young, we all made a show of thinking no better of ourselves than of our neighbors. Shaw found this effort wearisome, and had already given it up when he first burst upon the world. [Pp. 77–78.]

Even Russell, however, complains against Shaw for excessive vanity, for on one occasion Russell, who is surely no protector of the late Bergson, was alarmed at a luncheon in London in honor of Bergson to find Shaw expounding Bergson's philosophy in Bergson's presence. When "Bergson mildly interjected, 'Ah, no-o! it is not qvite zat!' " Shaw at once protested that he knew Bergson's philosophy better than Bergson did.

> Bergson clenched his fists and nearly exploded with rage; but, with a great effort, he controlled himself, and Shaw's expository monologue continued. [P. 78.]

Thus, Russell's disregard for humility has its limits, as also does his antagonism toward Bergson.

The Shaw piece is not only revealing of portraitist and portrayed alike; it is, quite typically, hilariously funny, too, for in it Russell describes a bicycle journey in which Shaw and he collided. Shaw was thrown twenty feet, but unhurt, whereas Russell's bicycle was wrecked, so that he had to entrain for home, while Shaw rode his home. So slow was the train, however, and so agile and unshaken was Shaw, that

> . . . at every station Shaw with his bicycle appeared on the platform, put his head into the carriage and jeered. I suspected that he regarded the whole incident as proof of the virtues of vegetarianism. [P. 76.]

Shaw is evaluated, too, as thinker and is said by Russell to have "considered wit a substitute for wisdom" and to have opposed vivisection not from sympathy for animals but from disbelief in scientific knowledge sought by vivisection. We are assured by Russell that "as an iconoclast he [i.e., Shaw] was admirable, but as an icon rather less so" (p. 80).

The only person whom Russell presents with unqualified admiration and affection is Whitehead. Here again we learn much about the portraitist. Whitehead's father, a vicar, had been called in to persuade Russell, already an empiricist at age three, to give up "trusting to the evidence of the senses" and to believe that the earth is round.

> Clerical authority so far prevailed as to make me think an experimental test worth while, and I started to dig a hole in the hopes of emerging at the antipodes. When they told me that this was useless, my doubts revived. [P. 99.]

But by the time Russell reached Trinity, he was recognized as a competent mathematician, by none other than Whitehead, who, we are told, at once won Russell's affection in class by publicly excusing him from certain mathematics assignments on the grounds that "you know it already," as shown by entrance examinations administered months earlier by Whitehead; and, further, by an-

nouncing, in advance of Russell's arrival, to "the cleverest undergraduates to look out for me, so that within a week I had made the acquaintance of all of them," and all of this "on the basis of the scholarship examination."

Whitehead, we learn, read "Sarpi's *History of the Council of Trent* as a bed book"; and even in Russell's undergraduate days Whitehead was nicknamed "the Cherub"; he was almost converted to Catholicism in his youth by Cardinal Newman; he talked to himself in "distressing soliloquies, and when he thought he was alone he would mutter abuse of himself for his supposed shortcomings."

On politics and philosophy Russell and Whitehead differed, because, as regards politics, Whitehead condemned Russell's stand against English participation in the First War, whereas, in philosophy, Whitehead was too enamored of

> the aspect of unity in the universe, and considered that it is only through this aspect that scientific inferences can be justified. My temperament led me in the opposite direction, but I doubt whether pure reason could have decided which of us was more nearly in the right. Those who prefer his outlook might say that while he aimed at bringing comfort to plain people I aimed at bringing discomfort to philosophers; one who favored my outlook might retort that while he pleased the philosophers, I amused the plain people. However that may be, we went our separate ways, though affection survived to the last. [P. 101.]

Just as Whitehead is treated most kindly in the collection of portraits, so also Santayana is held in the worst light, although D. H. Lawrence competes closely with Santayana for lowest honors.

Russell's "acquaintance with Lawrence was brief and hectic, lasting altogether about a year." His anti-intellectualist, antidemocratic, egomaniacal schemes Russell found quite repulsive:

> He, of course, in his imagination, supposed that when a dictatorship was established he would be the Julius Caesar. This was part of the dreamlike quality of all his thinking. He never let himself bump into reality.

Finally, Lawrence gave Russell some advice so inacceptable as to shatter their already tottering friendship:

> Do for your very pride's sake become a mere nothing, a mole, a creature that feels its way along and doesn't think. Do for heaven's sake be a baby, and not a savant any more. Don't *do* anything more—but for heaven's sake begin to *be*. Start at the very beginning and be a perfect baby: in the name of courage. Oh, and I want to ask you, when you make your will, do leave me enough to live on. [Pp. 113–114.]

If one wonders how the reflective Russell could have even listened to Lawrence for a year, Russell tells us: he had hoped to find in Lawrence some antidote to his own excessive reasonableness, a possible source of "a vivifying dose of unreason."

Santayana, however, is the object of Russell's most trenchant satire and the unqualified object of his dislike, both professional and personal. For one thing, Santayana annoyed Russell because

> even in country lanes he wore patent-leather button boots. I think a person of sufficient intelligence might perhaps have guessed these characteristics from his literary style. [P. 94.]

Also, Russell abhors his style as

> not quite what a style ought to be. Like his patent-leather boots, it is too smooth and polished. . . . I find myself, in reading him, approving each sentence in an almost somnambulistic manner, but quite unable, after a few pages, to remember what it was all about. [P. 96.]

Besides, Russell thinks Santayana "concealed the extremely reactionary character of his thinking" by his style; he adhered to neo-Thomism "under various aliases, so that it was easy for a reader not to know where his opinions came from . . . his views were completely those of mediaeval scholastics" (p. 95). Besides, Santayana, we are told, had he lived in Galileo's time, would have quarreled with Galileo over style, praising that of Lucretius as better, but ignoring his scientific content.

This Russell-Santayana mutual admiration society, however, is not just a case of an Englishman looking askance at a Spaniard; Russell also *agrees* with Santayana, at least on three points! (1) Both men shared strong feelings of patriotism, duly tinctured, however, with a historical perspective which enabled Russell to think himself, like Queen Elizabeth's fleet in comparison with the Spanish Armada in 1588, justly stronger than the Spaniard in national pride: ". . . my patriotic self-confidence was quite equal to his" (p. 93). (2) Santayana thinks American universities are alien to American vigor and Philistinism; and Russell agrees:

> It had seemed to me, in my wanderings through American universities, that they would be more in harmony with the spirit of the country if they were housed in sky scrapers and not in pseudo-Gothic buildings ranged about a campus. This was also Santayana's view. [P. 97.]

(3) Also, more significantly, Russell recognizes again that Santayana taught him to abandon Moore's view of "the objectivity of good and evil . . . though I have never been able to be as bland and comfortable without it as he was" (p. 96)! Nor, it may be added, did Russell ever recover from this blow, for, thenceforth, his ethics has been, on its theoretical levels, a house divided against itself.

At the same time there is a profoundly important agreement between these two antagonistic Titans, never noticed by either of them, at an utterly central juncture in their ostensibly alien phi-

losophies. Russell in his mature years regards occurrent qualities, such as red and yellow and foul smells and all shapes, as entities which, in the usual sense of "universals," are universals, that is, repeatable *in toto;* only he, for logical reasons, calls them particulars; and they are the stuff of the universe. Labels politely left aside, the shade of color before me is an individual, according to Russell, in the sense that it is named by a word that functions as a pure proper name, that is, a word that, *inter alia,* may appear, like old-fashioned substance words, in an atomic statement of any form whatsoever. Any entity named by a pure proper name is called by Russell a particular. Such particulars replace substances. Relation words refer to relations, which alone are by him called universals. Nevertheless, what is *peculiar* about these entities which Russell calls individuals is this: they behave like universals, in the old-fashioned sense, in this respect, that any particular, for example, a given color quality, chosen at random in New York may simultaneously and unequivocally be in San Francisco. Put technically, the point is that this quality red now before me may be to the right of itself, to the left of itself, north of itself, south of itself; it may precede itself; and it can succeed itself. Nor is it different *instances* of some super-red that are thus distributed about. The same *individual,* the quality red now before me, is in different places at the same time, and in different times, too. It has properties usually associated with nonrelational universals. Only we call it a particular for syntactical reasons. It all seems quite mysterious at first flush; but for those of us trained in the niceties of medieval theology, in which we learn of the omnipresence of the one individual God, totally present in every event, yet not exhausted in any, nor in them all, it is not at all strenuous to grasp Russell's theory of particulars, especially if one also knows a little modern logic. Among other things, Russell's view of particulars makes space and time into trivia, just as does the transtemporal theology. The stuff of the universe consists of qualities in relations; hence a vocabulary for sensible qualities and relations is sufficient for the expression of all human knowledge of everything in the universe—indeed, sufficient for the expression of God's knowledge as well.

What is more, when we avoid the pitfalls of novel terminology and recognize Russell's syntactical reason for calling these godlike qualities particulars, we discover that Santayana's *essences* have many of the same traits as Russell's particulars. According to both men, these entities, whether called particulars or essences, are found only within items in the concrete flux of nature. In both men, the way we differentiate between an occurrence of *this* par-

ticular or of this essence in New York and another occurrence of the same particular or essence in San Francisco is by the happy accident that the particular keeps company in New York with one group of particulars and with a different group in San Francisco. Except for this double life, we could not even talk of New York in contrast to San Francisco. But given this contrast, we can differentiate things in New York from those in San Francisco, without doubting, however, that it is the very same particular encountered leading one life in New York and a different life in San Francisco.

Santayana, of course, could never discover this element of agreement between himself and Russell because he would not have recognized an atomic proposition even if, as Russell would doubtless deny, his style had allowed him to frame one; *a fortiori*, he would have been mystified by Russell's notion of pure proper names. Russell, on the other hand, could hardly recognize the agreement, for, as seen, Russell fell asleep while reading Santayana. Besides, he lacked familiarity with transtemporal theology! This mutual missing is typical of great philosophers. But we, till we become too great to listen to other philosophers, can see the profound agreement between Russell and Santayana at this fundamental level.

Whether, had Santayana and Russell discovered this basic agreement, they would have disliked each other the less, I cannot be sure, but I doubt it. At any rate, Santayana would have still been quite unremittingly critical of Russell, for he, too, has expressed some strong antagonisms toward his English peer, only one of which Russell, as if generously, mentioned:

> He says: "Even when Russell's insight is keenest, the very intensity of his vision concentrates it too much. The focus is microscopic; he sees one thing at a time with extraordinary clearness, or one strain in history or politics; and the vivid realization of that element blinds him to the rest." And he accuses me, oddly enough, of religious conservatism. I will leave the reader to form his own judgment on this matter. [P. 98.]

Since Russell has been so surreptitiously harsh upon Santayana here, ought not Santayana to be allowed to speak back as if from the dead concerning Russell?

In the early days Santayana was extremely admiring of Russell, for at least five years. In apologizing to his sister Susana for not including a visit to her at Avila in the summer of 1909, Santayana gave as his reason the simple fact that

> the holiday is short, and I am thinking of spending it again chiefly at Oxford, where I have the Bodleian library to consult, and Bertrand Russell, the Earl's brother, to talk philosophy with.[1]

[1] Daniel Cory (ed.), *The Letters of George Santayana* (New York: Charles Scribner's Sons, 1955), p. 93.

Four years later Santayana was still counting on Russell for philosophical help. Again, writing to his sister Susana in 1913 from Oxford, he said:

> When this spurt of inspiration is over, however, I shall go back to the solid work, and I count on being stimulated especially by talking with Bertie Russell in Cambridge. . . . He is a logician and mathematician, strong where I am weakest, so that it is not always easy for us to understand each other on these abstract points. . . . I am anxious to put my view on some subjects (not on all) before him and to learn his more accurately. However, in the end every philosopher has to walk alone.[2]

Sanayana's expectations, however, were not quite fulfilled in this visit to Russell at Cambridge, if we may believe his reaction in a letter (Nov. 10, 1913) to B. A. G. Fuller after the summer, for of Russell he now complains:

> Bertrand Russell, on the whole, is not a very trustworthy thinker; he has the fault common to the political radicals of being disproportionately annoyed at things only slightly wrong or weak in others, and of flaming up into quite temporary enthusiasms for one panacea after another. His theory of the natural world is Mill-ish and almost Humian; it is, in comparison with the reality of nature and even of experience, what the report of a battle might be in the mind of a telegraph wire through which a full description of it had been sent. There would be a perfectly adequate representation of everything in dots, dashes, and pauses, but no blood, no passions, no drama, no heroes, and no poor devils. On the other hand, Russell's lectures on logic (one or two of which he has shown me) are very clear and enlightening. You will see what a delightful and witty creature he is personally; I hope Harvard and Boston will not weary and depress him. That is the danger.[3]

Whether it is less complimentary to a philosopher to remark upon his patent-leather shoes or to call him "not a very trustworthy thinker" is a moot point.

Three months later, Santayana, again writing to Fuller at Harvard, to which Russell was about to come, reaffirmed his distance from Russell even more clearly, and in a manner that remained permanently his view of Russell's allegedly superficial philosophy:

> Russell knows America and goes there with his eyes open: I imagine he would be grateful to be left alone as much as possible. His philosophy seems to have taken a new turn—to construct the universe out of sense-data. If this be realism, it is marvellously like empirical idealism. It has the same minimising and "nothing but" quality: it is a substitution of means for ends and of an analysis of knowledge for the object of it. Since I discovered this I have largely lost my interest in Russell as a thinker: but he is a very amusing person. There is a strange mixture in him, as in his brother, of great ability and great disability; prodigious capacity and brilliance here—astonishing un-

[2] Cory, p. 128. Written by Santayana as he was finishing *Dialogues in Limbo.*

[3] Cory, p. 129.

consciousness and want of perception there. They are like creatures of a species somewhat different from man.[4]

This comment on Russell by Santayana compares in virile hostility with Russell's remarks about Santayana's literary aliases concealing his Thomistic ancestry.

Six years later (1920) Santayana reiterated to the same Fuller his disapproval of Russell's brilliant but defective philosophy:

. . . and of course I read what Bertie Russell writes, although, as you know, I think he has relapsed into the British original sin of empiricism, and all his intelligence and keenness will not help him out of the consequent impotence and artificiality.[5]

Which is more rapier-like? To call a philosopher soporific? or to call one impotent and artificial? By and large Santayana and Russell, just as they compare favorably in patriotic fervor, seem quite equally competent as regards satirical ridicule each of the other. Philosophers, like religionists, love rivalry as much as they love truth.

In the end, Santayana is found (1931) laughing at Russell. From Elizabeth, the happy widow of Bertrand Russell's elder brother, he repeats this story:

She also told me that Bertie had presented himself at the House of Lords to take his seat, but had been rudely shown to the door; a brother must wait eleven months for the succession, in case his bereaved sister-in-law should have a posthumous male child.[6]

I cited this anecdote to Russell recently; he was not amused; but he confirmed that the occasion for his being turned away was the matter of a possible posthumous male heir, a probability which mathematician Russell had doubtless reckoned as extremely slight in view of the strained conditions long obtaining between his brother and Elizabeth.

Santayana indeed caught the essence of Russell's philosophy very early as regards its broad outlines: knowledge, according to Russell, is a matter of dots, dashes, and pauses, a highly abstract matter. Whether this be regarded as a misrepresentation of the world, however, depends upon one's conception of what the world is. According to Russell, of course, there are, strictly speaking, "no blood, no passions, no drama, no heroes, and no poor devils" in the world at all; all these are but metaphysical fictions, juxtapositions of qualities (Santayana's dots) and relations (Santayana's dashes); the pauses are not part of the ultimate stuff, being reducible to relations! Against this view of the world, Santayana

[4] Cory, p. 137.
[5] Cory, p. 181.
[6] Cory, p. 262.

is complaining and, quite properly, is associating it with the ultimate ontology natural to empiricism. Whether, however, Santayana here has a just complaint against Russell as one who has reverted to the original sin of British empiricism depends on whether Santayana and his metaphysical compatriots can make good his own attempted alternative muddy metaphysics by showing that "existence" as he uses the word refers to a realm of matter that is in itself in no way determinate but only a raw muck that can be so wrinkled up by the inherence of essences in it as to give rise to a physical order that is more than overlappings and compresences of qualities. He has not done so, though he had nearly a century to try it. Besides, philosophers before him, from Plato onwards, have tried in vain thus to conceive the inconceivable, and, unable to do so, have again and again expressed their angry frustrations by calling it just existence.

## II

If Russell's portraitures of other intellectuals are highly revealing of Russell himself, how much more so are his seven autobiographical essays! These, however, suffer somewhat by comparison with the other essays. They lack the seriousness of the distinctly philosophical ones; nor do they have the spice of the gossipy pen portraits. Also, they are less newsy. We all know that Russell entered philosophy with two anxieties, one as to the truth of theology and the other as to the certainty of geometry; that at age eleven he almost refused to study geometry because the axioms were presented to him as unproved assumptions. We also know that he leaves philosophy with himself still in anxiety over these questions! The first six essays, then, the autobiographical ones, are not so informative to those already familiar with Russell's career.

But one choice self-disclosure occurs in these self-portraits. Those who have known Russell personally must surely have marveled that he has not shown any hurts from a number of savage mishandlings of him. During World War I he was deprived of his fellowship at Trinity College, cast into jail, and refused a passport to the United States to accept appointment at Harvard, because of his qualified pacificism; decades later, he was excluded from the College of the City of New York, and later fired by the Barnes Foundation, though without loss of pay, thanks to a successful law suit that won him five years' pay for two years' work. But none of this embittered him, least of all the last. When he discusses these tough incidents in conversation, he does not talk of them reluctantly, nor with bitterness, but with a gaming spirit,

like a youth discussing last year's hard-fought contests. In dealing with evil men, one is customarily confronted by conventional moral wisdom with a simple alternative to hate them for their evil or to love them in spite of their evil. This option, however, is too limited, and men of reasonableness have learned a more excellent way, expressed in Russell's own long and tempestuous career, as also in Plato's and Spinoza's, and in Russell's words, as follows:

> It might be objected that it is right to hate those who do harm. I do not think so. If you hate them, it is only likely that you will become equally harmful; and it is very unlikely that you will induce them to abandon their evil ways. Hatred of evil is itself a kind of bondage to evil. The way out is through understanding, not through hate. [P. 176.]

Maybe Russell is no saint; but he is a sage.

## III

Of the portrait essays, I found one disappointing, that on John Stuart Mill. Yet here we might have expected to find Russell at his best, for Mill was chosen by Russell's free-thinking parents as his godfather—insofar as free thinkers may acknowledge godfathers. Besides, Russell's own ethical theories since Santayana's refutation of his intuitionism have been one-half emotivism and the other half straight utilitarian descriptivism, learned from Hobbes, Mill himself, and from its very ablest exponent, my revered teacher and dear friend, the late R. B. Perry, Russell's relative by marriage and a man from whom Russell admittedly learned much. That is, when Russell is writing on ethics, the evenly numbered pages are descriptivist utilitarianism; but the oddly numbered pages are emotivism. Preferring the evenly numbered pages, I should have enjoyed seeing Russell expound Mill's ethical theories, so similar to his own on the evenly numbered pages of his ethical utterances.

Perhaps Russell could be persuaded to write another essay on this topic, entitled "My Millside." In the end, as is shown by Russell's one systematic treatise on ethics since the Santayana refutation, namely, in his *Human Society in Ethics and Politics*, it is the Millside that becomes topside. Ethical judgments are assertions of relations of means to desired ends, of causes to desired effects. Emotivist talk survives in just two ways: as an account of how our ends are determined, and as an acknowledgment of emotional flavors clinging to these descriptive utterances themselves. Indeed, as regards the second, all statements *express* subjective states of the speaker, or nearly all; and they are designed to *indicate* objective states or connections in nature; that was one of Russell's three principal theses in *An Inquiry into Meaning and Truth*

(1940). The indicative function of ethical statements is viewed by Russell at last, as by Hobbes, Mill, and Perry, as assertions of cause-and-effect relations in nature, i.e., as relations between human actions and their consequences. So, in ethics, Russell's career witnesses the return of the repressed (god) father, his childhood friend, John Stuart Mill. This I wished Russell had recognized in his portrait of Mill. For all his praise of him, this Russell did not recognize. Mill's ethics are not treated, just his political works.

Russell's painful and confusing concession to Santayana against his Mooreside set him adrift in ethical theory for a long time. Leaving Moore's descriptivist intuitionism, he next became the hybrid thing, partly emotivist and partly descriptivist consequentialist, but in the end, his doublemindedness was resolved in the direction of Hobbes, Mill, and Perry. Desires determine our *ends* and such determination of ends by desire may be asserted by objectively testable propositions—Hobbes, Mill, Perry, and Russell; but science finds the means for our achieving them, and an assertion that an *act* is right is a species of scientific utterance, however much tinctured with emotive tones *expressed* by such *indicative* utterances—also Hobbes, Mill, Perry, and Russell.

## IV

Two of the essays are highly philosophical, that is, expressive of technical doctrines characteristic of Russell's esoteric philosophy.

In one of them, "Mind and Matter," Russell restates his view that all the sense contents of all our perceptions, and hence all mental events, are identical with events inside our cranial cavities. This intracranialist theory of mental events Russell has never been able satisfactorily to market, though it has been very dear to him now for nearly forty years (since *The Analysis of Mind*, 1921). It is his neutral monism.

The principal defect in Russell's presentation is *always* the same: either he enunciates his doctrine without adequate argument for it; or he argues for it without adequate enunciation of it. He seldom juxtaposes both his *argument* for intracranialism and his *formulation* of it. A reason for this is simply that the combined enunciation and argumentation must draw upon virtually all of the most technical and fundamental of Russell's views in both ontology and speculative epistemology. Still, the argument for his view could have been put more clearly by Russell. In *Portraits*, as usual, the enunciation of Russell's intracranialism fares better, the argument for it, poorer. But there is a simple argument for Russell's intracranialism. By omitting details one may state the essentials of Russell's argument for his intracranialism in three sentences:

1. Wherever the immediate causal conditions of an event are located, there also the event itself is located.

2. The immediate causal conditions of percepts are events located in one and only one spatio-temporal region, namely, in the brain of the perceiver.

3. Therefore, the percepts of any given individual are events located in the brain of that individual.

The first premise of Russell's argument, which asserts that occurrences are located in the region where their immediate causal conditions are found, may seem at first both surprising and original. Actually, it is merely an original adaptation of the familiar and ancient doctrine of spatio-temporal continuity in causal processes, which, being equivalent to denial of causal action at a distance, is embodied in familiar classical doctrines of causality like those of Aristotle, Descartes, Leibniz, and Hume. Hume, for example, in emphasizing that contiguity in space and time is one of the defining properties of causal relations, states it as follows:

> Tho' distant objects may sometimes seem productive of each other, they are commonly found upon examination to be link'd by a chain of causes, which are contiguous among themselves, and to the distant object; and when in any particular instance we cannot discover this connexion, we still presume it to exist. We may therefore consider the relation of CONTIGUITY as essential to that of causation.[7]

No originality, therefore, is involved in Russell's first premise insofar as it is merely a reiteration of the doctrine of spatio-temporal continuity in causal chains.

What is novel here is that Russell has derived from the time-honored doctrine of spatio-temporal contiguity in causal processes or denial of causal action at a distance two further doctrines about space which he confidently employs at important junctures in his metaphysics: (1) the doctrine that causal laws describing spatio-temporally continuous causal processes may be used to *define spatio-temporal order*[8]; and (2) the doctrine that by means of such causal laws, once space-time order has been defined, one may also *locate occurrences in the space-time order*.[9] It is this second doctrine that is involved in the first premise of Russell's argument for the location of percepts in the brain.

Russell has not always presented his argument with quite this degree of logical crispness. Consequently, Russell readers have

[7] Hume, *A Treatise of Human Nature*, Book I, Part III, Section II.

[8] *The Analysis of Matter*, pp. 303–312; *An Inquiry into Meaning and Truth*, pp. 122–128, 427–428; "Reply to Criticisms," in the Schilpp volume, pp. 705–706; *Human Knowledge*, pp. 81–84, 292–308, 326–327, 328–331.

[9] "Reply to Criticisms," in the Schilpp volume, pp. 705–706; *Human Knowledge*, pp. 320–321, 465, 469–472.

not always recognized the force of his argument nor the magnitude of the task involved in attacking it significantly. Nevertheless, if one surveys all the passages devoted by Russell to arguing for his intracranialism since he first began to defend it, it will be found that his arguments can in every case be reduced to the logical pattern exhibited above.[10]

This systematization of Russell's argument serves at least two important uses.

First, it makes promptly clear how Russell's intracranialism follows from certain readily identifiable doctrines fundamental to his system. The first premise is merely an extension of the doctrine of spatio-temporal continuity in causal chains, which is at the same time a denial of causal action at a distance. The second premise is the central doctrine of any form of the causal theory of perception and therefore of Russell's form of it, and is asserted by Russell to be supported by the best attested results of physics and physiology. From these two fundamental doctrines, central in Russell's philosophy of knowledge and nature, Russell's intracranialism follows, and follows with logical necessity. To be sure, neither one of the premises is a logically necessary truth, nor is the conclusion a necessary truth. All alike are contingent statements about the actual world. But the conclusion itself is a logical consequent of the two premises of this argument. Any system of philosophy, therefore, embodying the doctrines expressed in these premises must accept the doctrine expressed in the conclusion. Similarly, anyone rejecting the conclusion cannot accept both the premises but must reject at least one of them.

By indicating clearly the relation of Russell's intracranialism to these other central doctrines in his philosophy of nature, this formulation of Russell's argument serves, in the second place, to identify the doctrines and reasoning which must be attacked if one is to reject reasonably Russell's highly reasoned doctrine that percepts are events in the brain. If one is to attack this doctrine successfully, then either one must show that at least one of the premises is false or one must show that the reasoning is fallacious and hence that the premises, even if accepted, do not support the conclusion that percepts are events in the perceiver's brain.

I cannot reject either of these premises, though I have tried desperately to do so; I cannot find a defect in the inference, though I have earnestly sought to do that, too. Nor can I deduce a single absurdity from this conclusion or from its premises, though I have

[10] *Philosophy*, pp. 137–143, 213, 214, 280–281; *The Analysis of Matter*, pp. 382–387; *An Inquiry into Meaning and Truth*, pp. 379, 381, 427–428; "Reply to Criticisms," in the Schilpp volume, pp. 702–706; *Human Knowledge*, pp. 204–205, 230.

attempted that also, with the useless help of Lovejoy, who devoted approximately one-fourth of his *Revolt against Dualism* to attacking Russell's psychophysical doctrines, but only misrepresented and caricatured them. Therefore, while highly critical of those portions of Russell's philosophy most widely accepted, such as his over-all conception of programs of justification and interpretation of common-sense and scientific knowledge claims, I am compelled to accept his psychophysical doctrine, which nearly everyone poohpoohs, and which, emotionally, I, too, passionately detest. My sympathies are with those philosophers of whom Russell facetiously says:

> I horrified all the philosophers by saying that their thoughts were in their heads. With one voice they assured me that they had no thoughts in their heads whatsoever, but politeness forbids me to accept this assurance (p. 161).

But I accept Russell's fundamental ontology of events as over against a substantialist metaphysics; and I think his massive theory of causality the most important set of contributions to theory of causality since Descartes and Hume saw through the fog of the *mana* theories of causality, in which alleged surreptitious containment of the mysteries of all effects in their more mysterious causes was held a deep truth. And that causal conditions in the perceiver's nervous system literally generate sense contents I cannot deny. These three innocent doctrines, when juxtaposed, appear to yield the astounding conclusion that every sensible quality and relation of which I am directly aware is tucked away inside my cranium as truly as, and in the very same sense that, my heart is inside my chest.

Russell's psychophysical doctrine seems as fantastic as the ontological argument for the existence of God; this difference, however, prevails: in the case of the ontological proof, one may begin by merely feeling that it must be defective, and one can then find the defect, indeed, swarms of defects, in it; but, while feeling initially that Russell's psychophysical doctrine must be wrong, I cannot find any flaws in the premises or in the inference by which he reaches it. Nor has anyone else done so thus far, to my satisfaction. Hence, to reject it till such flaws can be found is tantamount to rejecting reason itself on the grounds that it produces unpleasant surprises. This I cannot do. Respect for reasonableness is sometimes embarrassing.

## V

As regards Russell's other highly philosophical essay, "The Cult of 'Common Usage,'" his pejorative term "cult," used to refer to the immediate circle of Wittgenstein, a circle now ever

widening, seems most apt. Still, his criticisms of this school I find too much a case of all-or-nothing. It is Russell's failure to find anything worth our while in this philosophical clique that annoys me, though but slightly. Sympathy is a virtue, even in matters of the intellect, even toward philosophical coteries alien to one's own sense of what is important in philosophy. Russell has never been disposed to treat pragmatism with discrimination; that is a limitation in philosophical sympathy. And now his own philosophical progeny, the disciples of his most illustrious pupil Wittgenstein, he likewise axes, even though a scalpel is called for and he is an expert at using a scalpel.

In spite of Russell's lashing out against Wittgenstein's messengers, his memory of the youthful Wittgenstein himself has not been tarnished, and he speaks of him in *Portraits* only with kindness:

> . . . at the time when I knew him well he was immensely impressive as he had fire and penetration and intellectual purity to a quite extraordinary degree. [P. 24.]

As Whitehead was responsible for discovering Russell and for his becoming established in Cambridge, so also Wittgenstein, inquiring for someone to help him with the foundations of mathematics, was sent to Russell at Trinity College, and, in this dramatic manner, was saved by Russell for philosophy:

> . . . for a whole term I could not make up my mind whether he was a man of genius or merely an eccentric. At the end of his first term at Cambridge he came to me and said: "Will you please tell me whether I am a complete idiot or not?" I replied, "My dear fellow, I don't know. Why are you asking me?" He said, "Because, if I am a complete idiot, I shall become an aeronaut; but, if not, I shall become a philosopher." [P. 23.]

Russell then proposed to Wittgenstein that he write something philosophical for him over the coming holiday.

> At the beginning of the following term he brought me the fulfillment of this suggestion. After reading only one sentence, I said to him: "No, you must not become an aeronaut." And he didn't. [P. 23.]

Russell confesses that Wittgenstein, even in the early days,

> was not, however, altogether easy to deal with. He used to come to my rooms at midnight, and for hours he would walk backward and forward like a caged tiger. On arrival, he would announce that when he left my rooms he would commit suicide. So, in spite of getting sleepy, I did not like to turn him out. On one such evening, after an hour or two of dead silence, I said to him, "Wittgenstein, are you thinking about logic or about your sins?" "Both," he said, and then reverted to silence. [Pp. 23–24.]

## VI

Anyone who reads *Portraits from Memory* will find new and telling clues to the background of tension and inspiration giving

rise to Russell's vast literary output, both philosophical and political. His friends in philosophy reach back to John Stuart Mill. As for immediate political roots, the man in whose home Russell was reared, his grandfather, Lord John Russell, twice a Prime Minister, was himself born during the French Revolution; he was a personal friend of Napoleon's and was tutored in his youth by Cartwright, whose invention of the power loom launched the Industrial Revolution; and he carried the Reform Bill in 1832, by which England began its swift move toward a modern democratic state. So familiar were the facts of national and international politics in the house, to which diplomats and parliamentarians regularly came, that little Bertie referred to two of the pieces of furniture closely crowded together as the Dardanelles.

This early acquaintance of Russell with things past and present in the political life of his nation and of the world was, however, in due time viewed as an acquaintance with but fleeting moments in the history of man, and change he soon saw to be man's habitat:

> Every corner of the house was associated with some nineteenth-century event or institution which now seems as remotely historical as the dodo. Everything belonging to my childhood was part of a now completely vanished world— . . . . For this reason our age produces bewilderment in many, but offers at the same time a possibly fruitful challenge to those who are capable of new thought and new imagination. [P. 121.]

Bertrand Russell has shown himself equal to the challenge of our age and, even in his ninth decade, capable of new thought and new imagination.

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## NOTES AND NEWS

Albert Richard Chandler, Professor Emeritus of Philosophy, Ohio State University, died at his home on March 22, 1957, of a heart attack. He was seventy-two years old.

The personal philosophy library of Ralph Barton Perry has been presented to the Brandeis University Library, Waltham, Massachusetts. The presentation was made by Professor Perry's sons, Ralph Barton Perry, Jr., and Bernard B. Perry. Included in the nearly 1000 volumes are first editions and rare volumes, many of which are annotated and were originally in the personal collections of Josiah Royce and William James. Many of the volumes also contain annotations by Professor Perry.

Errol E. Harris, formerly chairman of the Department of Philosophy at the University of the Witwatersrand, South Africa, has accepted an appointment as Professor of Philosophy at Connecticut College, New London, Connecticut.

The following were elected as officers of the Eastern Division of the American Philosophical Association for the year 1957:

President—Willard V. Quine.

Vice-President—Maurice Mandelbaum.

Secretary-Treasurer—Vincent A. Tomas.

Executive Committee—The foregoing officers and J. H. Randall, Jr., *ex officio* for one year, Peter A. Bertocci (1959), and Rulon Wells (1959).

The other members of the Executive Committee are: Victor Lowe (1957), John Wild (1957), Roderick Firth (1958), and Gregory Vlastos (1958).

The next annual meeting of the Eastern Division will be held at Harvard University, December 27–29, 1957.

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Stechert-Hafner, Inc., New York – Atlas Publ. & Distr. Co., Ltd., London – Hermann & Cie., Paris – Nicola Zanichelli, Bologna – H. Bouvier u. Co., Bonn a/Rh. – J. Villegas, Madrid – F. Machado & Cia, Porto – Gerold & Co., Wien – F. Rouge & Cie., Lausanne – The Maruzen Company, Tokyo.

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